THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

National Gypsum Company's new quarry near Halifax, Nova Scotia

FEBRUARY 1955

DRAGON CEMENT CO.

never runs out of jobs

FOR OLD NO. 1

"Old No. 1" is a 500-cu.-ft. Worthington compressor powered by a Caterpillar D13000 Diesel. It's shown here doing one of the most unusual jobs in its eight years of hard work life. Dragon Cement Company, Inc., of Thomaston, Maine, is drilling a tunnel 33 ft. in diameter, 350 ft. long under a highway, opening up a new rock supply. "Old No. 1" supplies steady, reliable power eight hours a day, often seven days a week, the year around—just as it has since 1946 with only one overhaul.

Dragon Cement has another D13000 in a second compressor which has also been on the job about the same length of time, and with the same record of trouble-free performance. In addition, the company has two CAT* D3400 Engines in Keystone well drillers, plus two Caterpillar track-type Tractors.

H. B. Kaler, assistant superintendent, says that Dragon likes Cat equipment because of easy, low-cost maintenance and sure-fire starting in cold Maine winters. In pit and quarry work, Caterpillar-designed seals and filters keep lubricants *in* and harmful abrasive particles *out*. Also important in high-profit performance is the Caterpillar fuel injection system, which delivers full power *without fouling* on inexpensive No. 2 furnace oil.

The *new* Cat D13000, with increased horsepower, develops more power per gallon of fuel and is built for even longer work life and easier maintenance. Your Caterpillar Dealer—who provides fast, dependable service—will gladly give you more information on this and other Caterpillar Diesel Engines and Electric Sets, to 520 HP and 315 KW.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

MODERN
HEAVY-DUTY POWER

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

There goes a turnpike in the rough

A typical example of B. F. Goodrich improvement in rubber

IT'S down the hatch—20 barrels a minute—as dry cement whistles through that hose and pours into the ship's hold.

A wonderful idea—pumping cement through hose—much faster, far cheaper than individual sacks that had to be carried on and off the ship. Only one trouble.

Turn off the pump, and the hose would collapse, putting permanent dents in the coil of solid steel wire buried in the rubber. B. F. Goodrich engineers went to work on the problem, and came up with a new hose design. They put a spiral of flexible steel cable in the hose body. That makes the hose flexible as well as strong, so it always returns to full round shape under pressure.

The B. F. Goodrich hose was tried, and works perfectly. It has carried more than 1½-million barrels of cement—enough to pave a 100-mile stretch of turnpike—and shows no sign of wearing out.

Product improvement is *always* going on at B. F. Goodrich. Some improvements are big, spectacular; some are little; many are too technical to explain easily, but all save you money. If you use hose, belting or other rubber products, remember B. F. Goodrich is one company that will *never* lower its quality standards. This means you can be sure of top performance and real money savings.

To get this extra value, these lower costs year after year, call your B. F. Goodrich distributor. Find out about the latest improvements or try out the latest and best types of any rubber products you buy. *The B. F. Goodrich Company, Dept. M-373 Akron 18, Ohio*

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ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY — LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

February 1955

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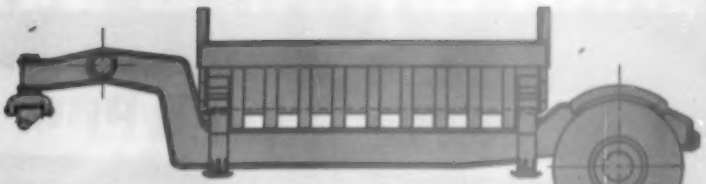
Coming!



NEW EASTON TP 36 TONS (LIMESTONE) • 50 TONS (IRON ORE)

New all-welded TP-2736 nears completion. View shows box-section body cradles and double-acting hinges.

Dependable overhead dumping is essential.
Above: Easton standard package overhead electric dumping system – job-proved in hundreds of mines and quarries ...*exclusive* with Easton.

Bigger Payloads!

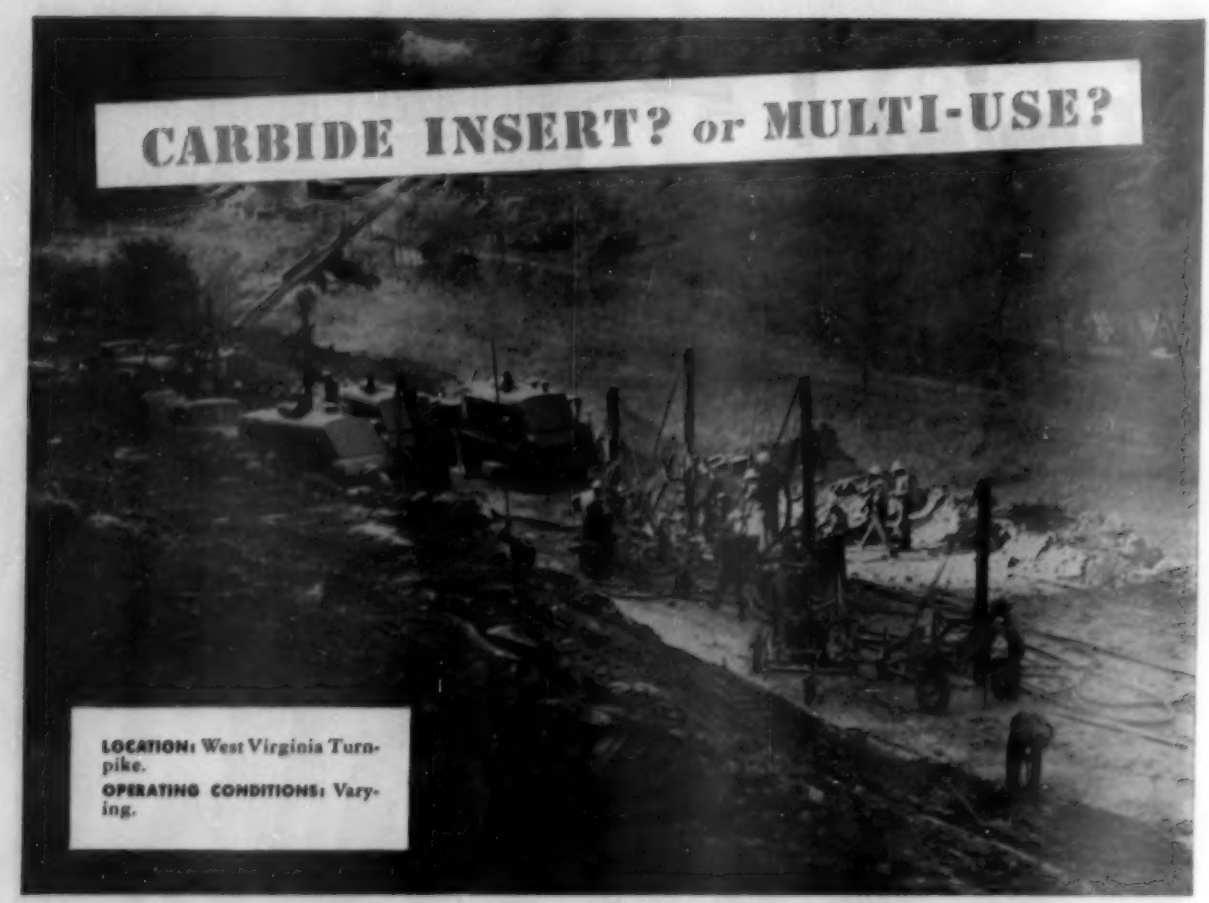
IN PRODUCTION at Easton...the first TP-2736 fleet...the most exciting forward-looking development in a decade of automotive transportation in mines and quarries. Here you have, for the first time, the job-proved dependability of Easton's cost-busting *doorless* pan in an all-new, low-frame trailer, rated at 36 tons limestone (Model TP-2736), 50 tons iron ore (Model TP-2750). Smart planning for 1955-60 calls for bigger payloads than ever before...at lower cost! Get the facts now on the great new Easton TP trailers, in capacities from 10 to 50 tons.

NOW is the time to modernize your hauling. Order now for early deliveries.

EASTON®

B-1067

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.



14 out of 17 contractors on new West Virginia turnpike cut drilling costs with TIMKEN® multi-use bits

SEVENTEEN contractors equipped with 189 wagon drills did the drilling on the new West Virginia turnpike and 14 of them used Timken® multi-use bits. Some tried other makes and then switched to Timken bits.

These 14 contractors found that, all things considered, Timken multi-use bits gave them lowest cost per foot of hole drilled. In the first place, the large range of Timken bit types and sizes enabled them to select the best bit for each job. Good bit reconditioning service was on hand and the contractors were able to secure a number of bit uses.

If you're drilling ordinary ground, Timken multi-use bits are most economical. However, for extremely hard and abrasive ground, Timken *carbide insert* bits drill faster and more economically. They're also best for drilling constant-diameter holes, small diameter blast holes, extremely deep holes. Some of the turnpike contractors used Timken carbide insert bits when they encountered exceptionally abrasive ground.

All Timken bits are interchangeable in the same thread series and a wide range of different bits fit the same steel. You can change bits right on the job. All Timken bits are made from Timken fine alloy steel and have special shoulder unions to protect the threads from drilling impacts.

Get the bits best fitted to your drilling needs. Call the Timken Rock Bit Engineering Service. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken multi-use rock bit

Timken carbide insert rock bit

your best bet for the best bit ... for every job

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

No S-T-U-T-T-E-R in the bank!

and Accurate Spotting!

Keep the Crusher at Maximum Production!

● Here is a Northwest Model 25 keeping the crusher on the jump in the pit of Linck-Amundson of Juneau, Wisconsin.

● No stutter — no restarts — no dipper juggling! That's the result of just one of the features that make Northwests fast. Northwest advantages are the answer to a part of your pit problems and the business of keeping material ahead of your crusher needs.

The Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste. It's a clean cut through the bank without delays or restarts. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and make spotting smooth and easy, reducing spillage. The "Feather-Touch" Clutch Control takes the heavy work out of throwing drum clutches without resorting to compressors, pumps, valves or other delicate mechanisms. Northwest Steering reduces the delays of relocation. These are just a few of the advantages that have put so many Northwests in the gravel pits of Wisconsin. They help to assure maximum crusher production!

Why not find out why so many contractors and gravel producers in Wisconsin have bought Northwests again and again. Let us give you the full story.

If you need rubber tired equipment, Northwest Truck Cranes bring you a combination of advantages in Crane and Carrier not found in other similar equipment. Get the details before you buy.

NORTHWEST ENGINEERING CO.

1514 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Convertible for any Mining Material Handling or Excavation Problem

"Your PERMANENTE brick lining in this kiln has smashed all records here for service. The kiln came down after a run of 18 months, 8 days—topping the previous record by 2 months. This is 6 times the life we used to get with 70% alumina."

This report from a leading cement producer is only one of many showing how Permanente Periclase-Chrome A brick dramatically improves hot zone service.

This improved service is possible because Permanente Brick is *especially designed* for hot zone linings to provide great volume stability under loading, high resistance to spalling and to chemical attack by cement clinker at high temperature. Think what this means in shutdowns eliminated!

In addition, Permanente Periclase-Chrome A Brick takes a good coating in the kiln, usually without inducement.

If you are not yet using Permanente brick, let us show you *now* how its superior performance can give you increased clinker production at lower cost!

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California . . . First National Tower,* AKRON *8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana* (CHICAGO).

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Alumina • Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Periclase

DO YOU KNOW WHAT IT MEANS TO

Have Your Rock Crushing Plant "Traylor-Made"?

It means a great deal in terms of profits to have a plant "Traylored" to your individual requirements. It assures maximum efficiency through both the primary and secondary stages of stone reduction.

In the plant shown above, two Traylor TY Reduction Crushers and one Traylor Apron Feeder team up to assure a high output of uniform aggregate with a minimum of waste fines.

Traylor TY Crushers are noted for their high hourly capacities and low power consumption. This is due to Traylor's original curved concaves and bell heads. These *curved* crushing surfaces apply power more efficiently, reduce lifting and churning of material in the crusher. The result is less power used per ton of rock reduced . . . less power wasted in choking and packing.

Traylor TY Crushers are built in 6 sizes with hourly capacities from 4 to 590 tons per hour. Write for bulletin 7112 and see why a "Traylor-Made" will produce at a profit for you, too.

TRAYLOR ENGINEERING & MFG. CO.
725 Mill St., Allentown, Pa.
Canadian Mfrs.: Canadian Vickers, Ltd., Montreal, P. Q.

A Traylor leads to greater profits

SEND FOR BULLETINS
. . . just mention the Traylor Equipment that interests you.

SALES OFFICES · NEW YORK · CHICAGO · SAN FRANCISCO

Four TR-200's work up to 460 hours a month . . . average only 4 hours down time

In less than a year, the George W. Kerford Quarry Company, Atchison, Kansas, put 3,828 hours of work time on each of their four Allis-Chalmers TR-200 Rock Wagons. They piled up 460 hours a month over one five-month period. During the year, service down time for each unit averaged only 4 hours a month . . . this means that each rock wagon was on the job over 98 percent of working time!

The TR-200's have been hauling quarry stone from the pit to a crushing plant 1½ miles away. Loads average 16 tons and each cycle is completed in 14 min. Fuel consumption has been about 3¼ gal per hour with no oil needed between changes.

George E. Kerford states, "We like the TR's maneuverability and easy control, which makes it possible for any good truck driver to learn to drive the outfit quickly. The wagon body is well constructed and cleans easily and completely. We find that most parts needing frequent maintenance and repair are easily accessible."

HERE ARE THE FEATURES BEHIND THIS OUTSTANDING RECORD

Big bowl top makes excellent target for shovel or dragline operator, helps loading under bins or chutes.

High power-to-load ratio of 16 hp per yard of capacity speeds hauling, helps on steep grades.

Maximum lift angle of 70 degrees speeds dumping of any type material. Big opening and "bathtub" design slide loads out fast at minimum dump angles.

Dumps 30 in. back of rear wheels to put entire load over banks or into hoppers.

Wheel base stays fixed during dumping cycle for greater safety on banks, accuracy in spotting loads.

Four-wheel air brakes allow full control, safer dumping over banks.

Hydraulic control system raises or lowers bowl while traveling, gets TR-200 into position sooner.

176 hp engine — 5 speeds forward to 21.6 mph, reverse 2.5 — 11 yd struck, 15 yd heaped, 18 tons

Write for complete catalogs or ask your Allis-Chalmers dealer for a demonstration

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Shown here is some of the equipment of the Naranja Rock Company of Naranja, Florida, which supplies customers in Southern Florida with sand, gravel, ready mixed concrete and concrete blocks.

Output up, maintenance costs down with

GULF QUALITY FUELS and LUBRICANTS

at Naranja Rock Company

This progressive firm keeps all of its equipment in top operating condition with the help of Gulf quality fuels and lubricants, which they have used exclusively for many years. They have found that Gulf products help them get more work hours from equipment with lower maintenance costs.

Take stock of the advantages offered by Gulf petroleum products and service. You get quality lubricants that provide an extra margin of protection for every gear and bearing; fuels that burn evenly and completely, with fewer engine deposits; and expert petroleum engineering counsel.

Try Gulf quality products and friendly, dependable service now. Contact your nearest Gulf office today and have a Gulf Sales Engineer recommend the right types and grades for your equipment. Gulf Oil Corporation · Gulf Refining Company, 1822 Gulf Building, Pittsburgh 30, Pa.

GULF

The finest petroleum products for your every need

This is the reason why business is good at the SECO factory...

Year in and year out, an ever increasing flow of SECO Vibrating Screens is going out to new and repeat customers all over the country.

As in the typical shipping room scene to the right, much of our production goes to operators who already have one or more SECO Vibrating Screens on their job. They know from experience. At the same time, more and more operators are installing their first SECO Vibrating Screens.

In either case, the big reason why SECO sales are soaring is on-the-job performance. You simply can't beat SECO for smooth, trouble-free performance. As a matter of fact, there are SECO screens still on the job after as many as 19 years of service.

ONE USER TELLS ANOTHER

Whether you're screening sand, gravel, stone, cinders, gypsum slag, ore or minerals, there's a right SECO for your job. SECO makes over 350 models in single, double, triple and three and one half deck designs.

SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

SCREEN EQUIPMENT CO., INC. BUFFALO 25, N. Y.

After All It's Performance That Counts..and one

FOR A MARBLE PRODUCTS CO. IN GEORGIA

FOR A SLAG PRODUCER IN PENNA.

FOR A CUBAN PRODUCER

FOR A MINING OPERATION ON THE WEST COAST

Remember, only SECO has fully controlled true circular action thanks to SECO's patented construction.

user tells another about SECO performance!

LOADING "Nitramon," the safest blasting agent known, in a southern quarry.

For better breakage, with maximum safety . . . use Du Pont "NITRAMON"®

You benefit two ways with "Nitramon" on the job. Here's a blasting agent that hits hard, yet has excellent spreading properties, thus assuring good digging.

Yet with all this power, blasting is safer. Du Pont "Nitramon" is unaffected by flame, friction, sudden shock, or caps—and, when fired with a "Nitramon" Primer, also relatively insensitive, gives the safest combination known for quarry blasting. Both are non-headache-producing and greatly reduce the chance of premature explosions—two reasons why crews throughout the field like to work with them. And "Nitramon" comes in sturdy metal containers that are both watertight and weatherproof.

So test "Nitramon" soon in *your* quarry. You'll be convinced: it's the safest blasting method you can use. For complete information on this and other members of the Du Pont "blasting team": "Nitramon" Primers —Pelletol—and MS Delays—contact the Du Pont man in your district or write: E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Del.

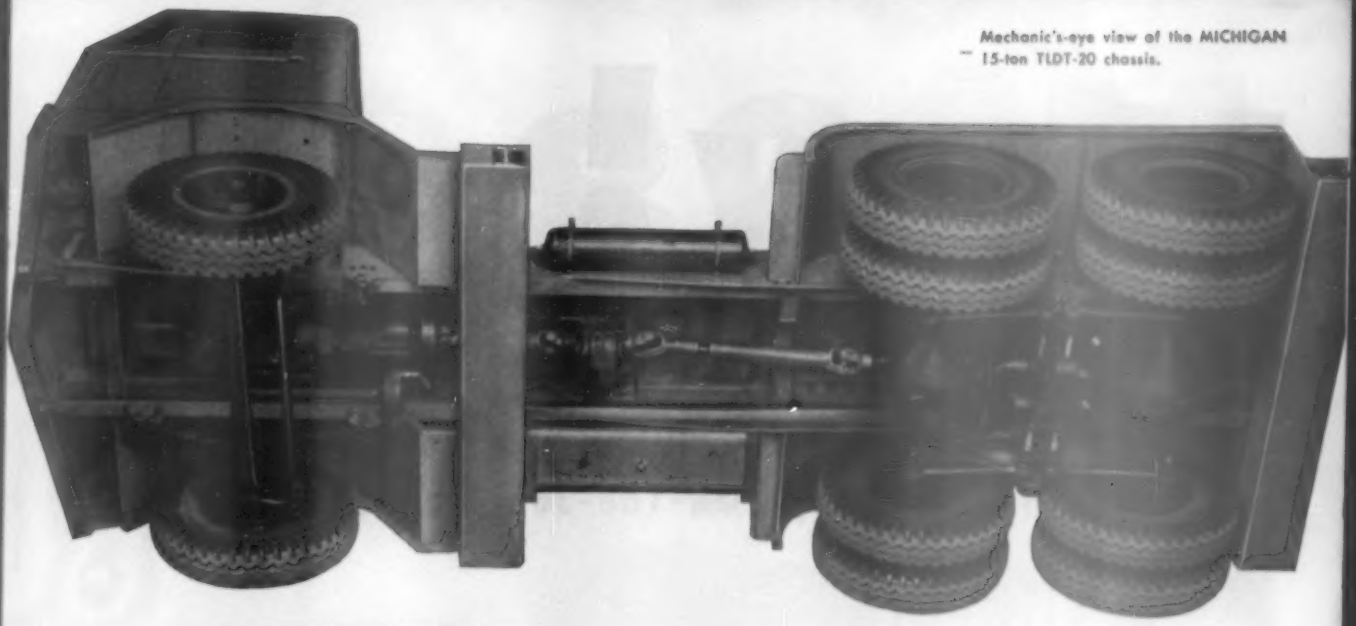
DU PONT "NITRAMON"

Product of Du Pont Research

DU PONT

®REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

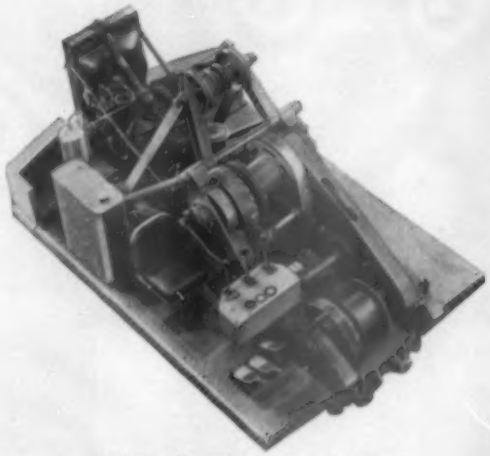


Mechanic's-eye view of the MICHIGAN 15-ton TLDT-20 chassis.

NEWS!...More Quality Features

are Standard Equipment on MICHIGAN

½ yard models than on any comparable machine



The basic ½-yard turntable mechanism —maximum service accessibility.

Front-view of four of the MICHIGAN's six adjustable hook rollers.

In your point-for-point comparison (a smart buying tactic!) take special note of these great value features—"extras" on many other makes, standard on MICHIGAN ½ yard Truck Excavator-Cranes.

16-Ton Axles — tremendous strength! No wonder your MICHIGAN stands years of punishment.

404 Cubic-inch Truck Engine—huge power! Compare it to other ½-yard machines.

Cast Steel Turntable—machinery deck with boom hinge-pin bracket and hook roller brackets in a single rugged steel casting.

6 Hook Rollers—on most others you get only 3 or 4. MICHIGAN rollers are ball-bearing mounted for friction-free swings and tapered for easy adjustment.

Air Powered Clutches—famous for smooth, positive action; faster swing; minimum fatigue; and easy, quick service.

Ball Bearings—on all shafts and drums.

Power Up and Power Down — on the front drum for precision crane work.

Add these up and get this sure-thing, profitable answer: You Move More With A MICHIGAN. For more information, contact your local MICHIGAN distributor. Or send us the coupon.

MICHIGAN Tractor Shovels are available under the Clark Leasing Plan—we'll be glad to send you details.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY 36
Construction Machinery Division
452 Second St., Benton Harbor, Michigan

☐ Please send MICHIGAN ½-yard Bulletin ☐ Send Lease Plan data sheet

Name_____ Title_____

Firm_____

Address_____

City_____ County_____ State_____

Now!

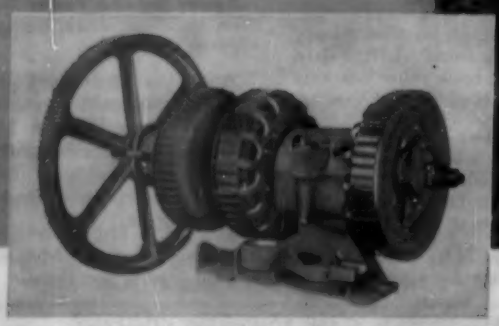
CUT OPERATING COSTS

A Big 2 Cu. Yd. Machine Designed Especially For Fast, Easy, On-The-Job Conversion

THE "RIGHT" SIZE — Big and strong enough for impressive yardage in rock, shale and dirt. Small enough to travel easily on a rail car without major dismantling. Gets around easily in close quarters.

EASY FIELD CONVERSION — Easily convertible in the field from shovel to dragline, clamshell, crane, hoe or pile driving service.

TORQUE CONVERTER — Automatically gives operator extra torque as needed, extra speed when load is light. Protects machinery from shock. Makes all-around better use of available engine power.



NEW, SELF-COOLING SWING CLUTCHES —The use of aluminum friction shoe carriers with fins and air passages on clutch housing and large holes in the friction housing assure cool performance.

SELF-RAISING GANTRY — Powered up or down quickly. High, retractable gantry decreases stress on boom for crane work.

with THE 83-M

• Excavating • Slugging It Out On The Rock Pile
• Pouring Concrete • Setting Steel • Driving Piling

FEATURES THAT COUNT!

A BIG CRANE — Handles 60 tons on 50′ boom at 12′ radius. Wide crawlers on 12′ 11″ centers available for extra stability.

WORM TYPE BOOM HOIST — "Power up and power down" boom hoist optionally available to permit simultaneous propelling or swinging and boom hoisting.

THIRD DRUM—An optional third drum permits hanging suspended leads, handling of piling, snaking in or snubbing loads or for use as a high-speed boom hoist.

AIR CONTROL SPEEDS PRODUCTION — Only 12 pounds of hand pressure on the compensating-type air control valve releases full machine power for increased production, reduced operator fatigue.

ANTI-FRICTION BEARINGS — Roller or ball bearings, sealed against dirt and fitted for easy lubrication, at all principal friction points. Gears run in oil bath.

OUTSTANDING CRAWLERS — Self-cleaning, non-clogging crawlers never need attention. Belt tension easily adjusted.

See your nearby distributor today.

MARION • OSGOOD • GENERAL O-G

MARION POWER SHOVEL CO. • MARION, OHIO, U.S.A.

A Subsidiary of Merritt-Chapman & Scott Corporation

POWER SHOVELS FROM ½ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES

DRAGLINES • CLAMSHELLS • CRANES • BACKHOES
TRUCK CRANES • MOBILCRANES • LOG LOADERS

Your Confidence Is Justified /// Where This Flag Flies

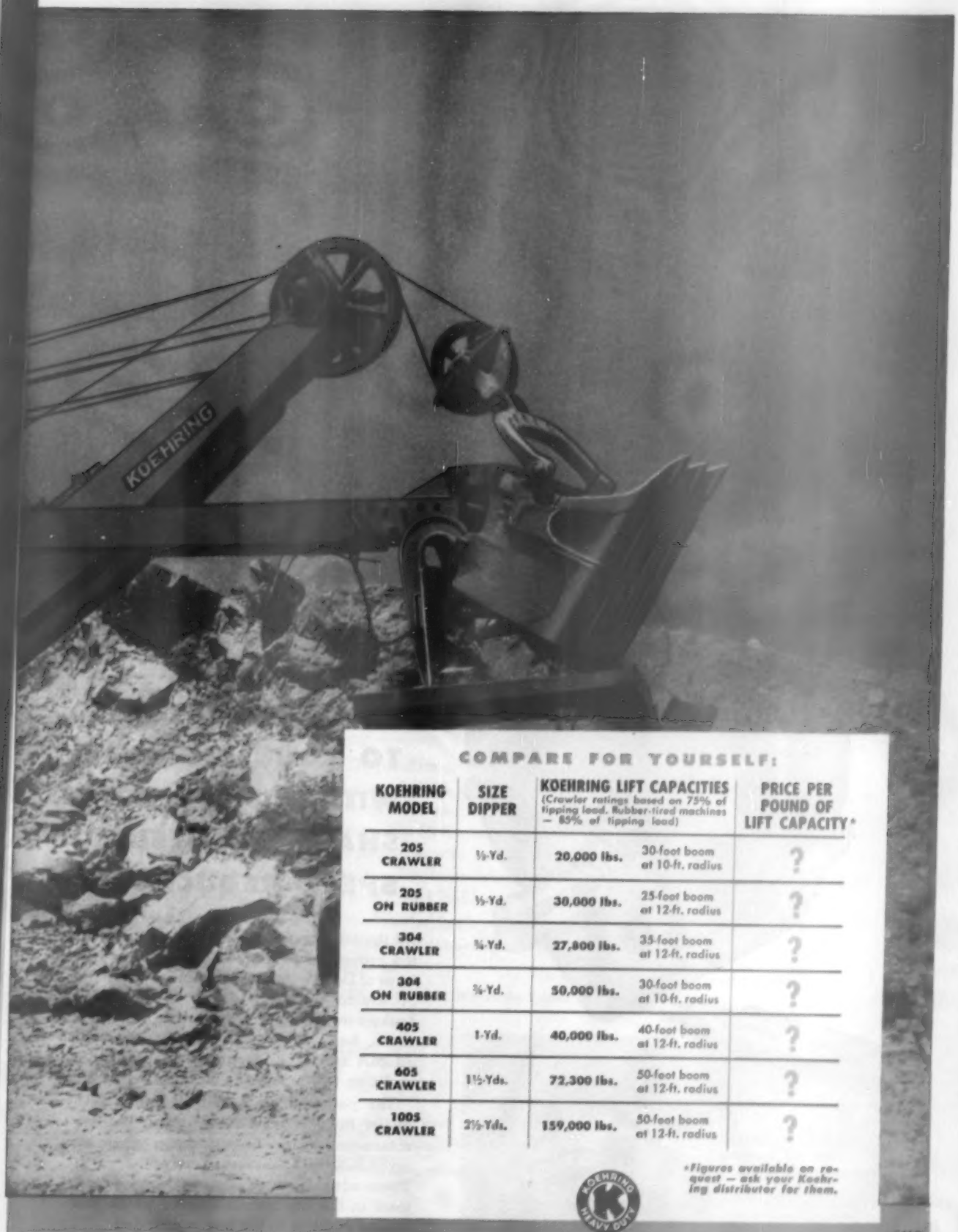
Measure excavators

by price per pound of lifting capacity

In analyzing shovel operation, you will find that price per pound of lifting capacity on crane rating is also an excellent measurement of excavator value. Remember, lift capacity is *work capacity*. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength, speed and stability to handle bigger loads faster with every excavator attachment.

Check Koehring lift ratings shown on the next page — then ask your Koehring distributor to give you the figures on price per pound of lifting capacity.

KOEHRING COMPANY Milwaukee 16, Wis. Subsidiaries: JOHNSON PARSONS • KWIK-MIX



COMPARE FOR YOURSELF:

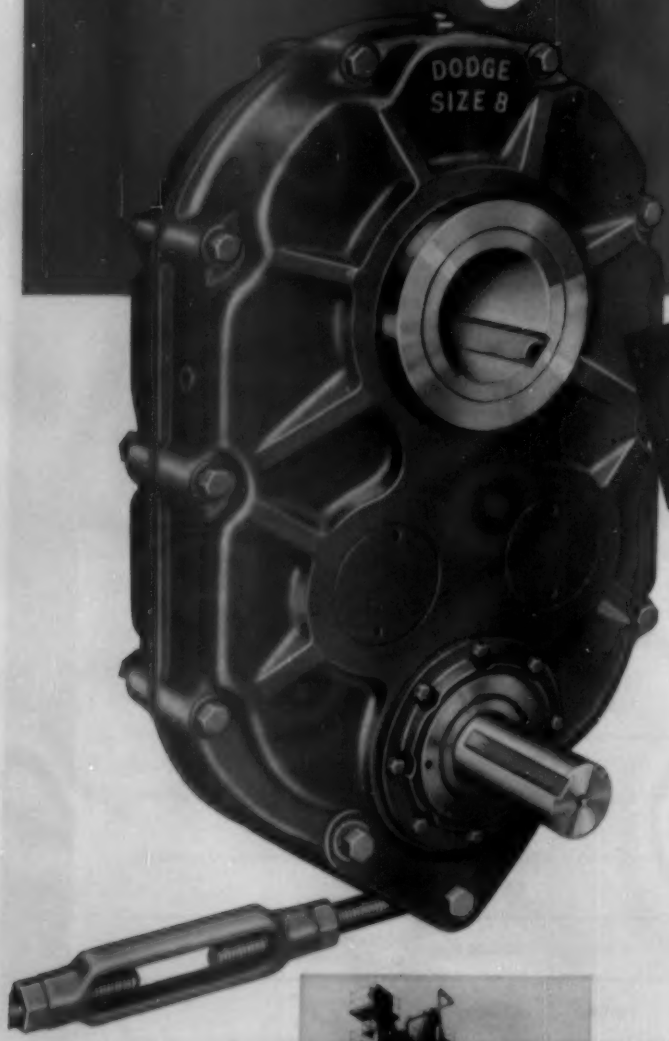
KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAPACITY*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

Figures available on request — ask your Koehring distributor for them.

KOEHRING HEAVY DUTY

DODGE Torque-Arm

America's most complete



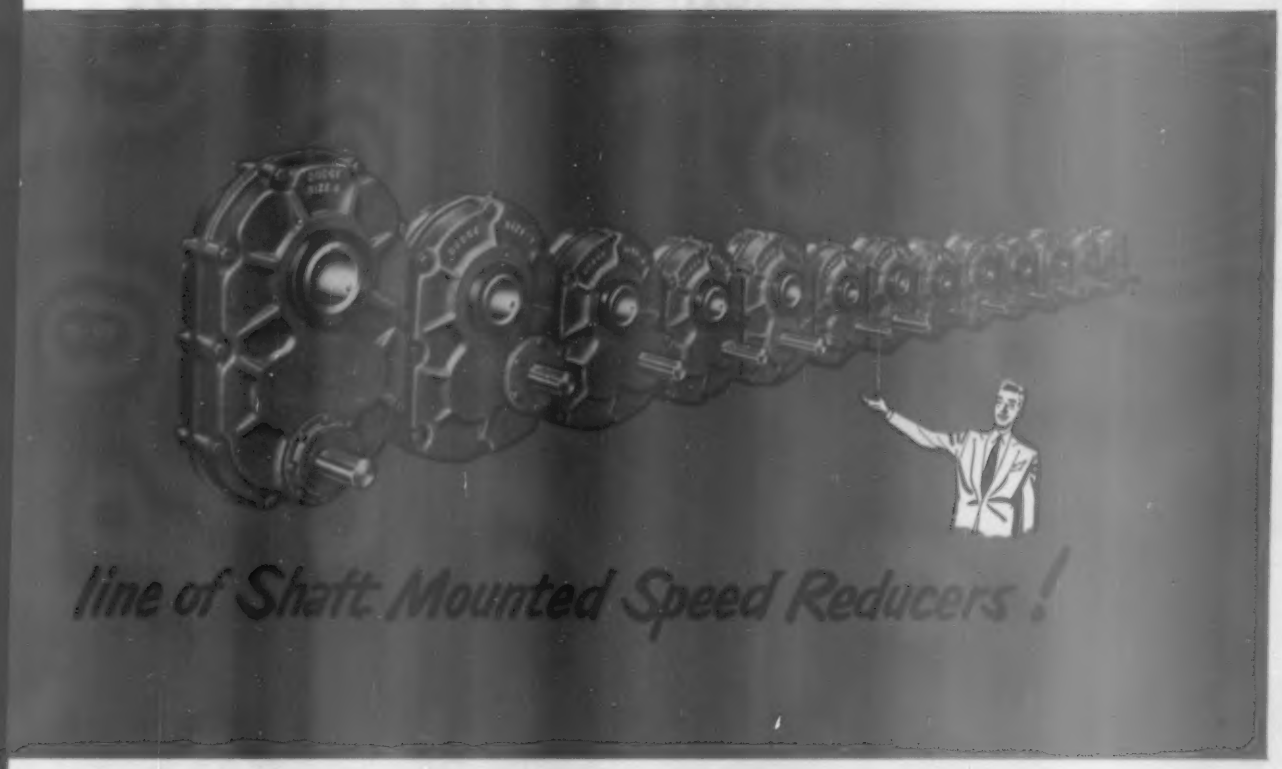
NOW-

SAVINGS EXTENDED TO YOUR BIG JOBS WITH THIS NEW 60 H.P. SHAFT-MOUNTED SPEED REDUCER!

All the advantages of shaft-mounting . . . all the proven performance and economy features of Dodge Torque-Arm Speed Reducers . . . are now available for your *big* jobs. The husky new size No. 8, in the double reduction series, has a capacity of 60 hp at 100 rpm, AGMA rating, and can be mounted on shafts up to 5-inch diameter.

The performance record of Torque-Arm Speed Reducers, as demonstrated in tens of thousands of installations, shows efficiency up to 97%, and substantial savings in costs. These advantages will be even more significant in the big installations for which this newest addition to the line is provided.

Torque-Arm Speed Reducers driving the trunnions rotating an asphalt kiln.



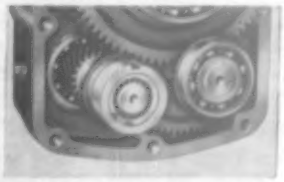
The new No. 8 has all the inherent advantages of the Dodge Torque-Arm line. No foundation, no flexible couplings, no sliding base required—and there are no lining up difficulties. It is mounted directly on the shaft. The torque-arm, fastened to any fixed object, anchors the reducer. The unit is driven through V-belt drive. Dodge Taper-Lock Sheaves, available from stock, permit any speed ratio desired.

Another new member of the Torque-Arm line is the single reduction No. 11 (1.3 hp at 100 rpm, AGMA rating). Torque-Arm Reducers are now supplied, in both single and double reduction series, with capacities from 1 to 60 hp, output speeds from 12 to 365 rpm. All sizes are available with built-in backstop as well as the Tri-Matic Overload Release which is designed especially for the Torque-Arm Speed Reducer.

For detailed information and recommendations for applications to your needs, call the Transmissioneer, your local Dodge Distributor. Or write for Bulletin.

DODGE MANUFACTURING CORPORATION, 2800 Union Street, Mishawaka, Indiana

Tri-Matic Overload Release, optional, loosens the belts, cuts off power, gives a warning in case of an excessive load.



Built-in backstop is available when conditions require a device to prevent the reversal of direction of rotation.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE

of Mishawaka, Ind.

Mixer Blade Life Increased 19 Times

by **Hard-Facing**

Blades hard-faced with HAYSTELLITE tungsten carbide rod have been in operation for 20 months—and are still in good condition. They have mixed 36,000 cubic yards of concrete while operating 3 shifts a day, 6 days a week. Unprotected cast steel blades had to be replaced every 4 to 5 weeks while operating under the same conditions. More than 19 shutdowns have been eliminated by hard-facing, and repair and replacement costs have been cut sharply.

Big savings like this are not unusual when HAYNES hard-facing products are used to prolong the life of equipment. These wear-resistant materials give outstanding service when used to protect conveyor screws, buckets, crushers, tractors, and other equipment exposed to abrasion, corrosion, impact, or heat.

Your local dealer carries a complete line of HAYNES hard-facing alloys, including HAYNES iron and nickel-base rods, HAYNES STELLITE cobalt base rods, and HAYSTELLITE tungsten carbide tube rod. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

See... | **Your local Haynes Stellite Dealer**

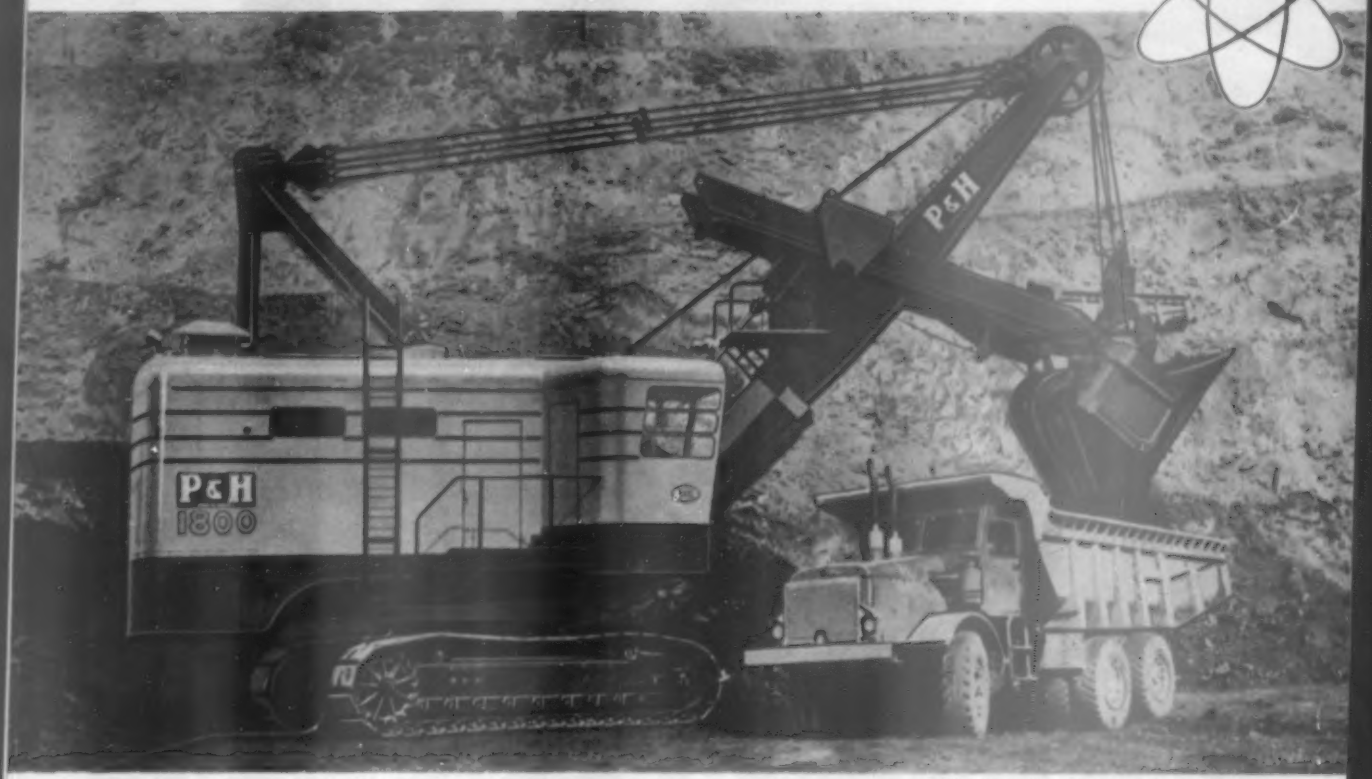
or

Write... | **to Haynes Stellite Company**

"Haynes," "Haynes Stellite," and "Haystellite" are registered trade-marks of Union Carbide and Carbon Corporation.

Another P&H "first"

Electronic Control!



P&H Model 1800 (8 Cu. Yd. Capacity)

a great forward step in Electric Shovel performance

ELECTRONIC CONTROL — using grid control thyraton tubes for the first time on any electric shovel. Applied to all operating motions! Results in finer performance characteristics . . . more rapid response . . . better co-ordination for the operator . . . from 5% to 10% faster cycle. Thoroughly proved in more than 5 years of field installations as well as on military aircraft and combat vessels. Now standard equipment on all P&H Electric Shovels — ready to give you increased production, lower tonnage costs!

THE 1000th MAGNETORQUE*! The most highly advanced means of power transfer yet developed — now proved on P&H Shovels in the most severe types of service. Here's smoother operation, extra power, greater bail pull. Electromagnetic operation makes it friction-free, wear-free, worry-free! Magnetorque lasts the life of the shovel.

ONE RESPONSIBILITY. All electrical equipment on P&H Electric Shovels is designed and built specifically for shovel service — not adapted for it. And P&H, the builder, takes the entire responsibility for service. There's no buck-passing among suppliers. P&H service is tailored to your needs.

Write for complete information.

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

P&H ELECTRIC SHOVEL DIVISION

HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN

the P&H Line

Above Rear-Dump handles 53% of limestone haul for Allegheny Mineral Corp.

The LeTourneau-Westinghouse machines you see here — a 186 hp Tournatractor and an 18-ton Rear-Dump — have been used by Allegheny Mineral Corporation, Cowansville, Pennsylvania, since the summer of 1953 both for stripping and for hauling shot limestone. Units work alternately at Allegheny's pits in Parker's Landing and Kittanning. They make trips between the two places under their own power. The Rear-Dump drives the 35 miles through traffic in about an hour; Tournatractor makes the trip in about two hours. Fingertip electric power steer and 4-wheel air brakes (more braking surface on 1 wheel than most units have on all 4) make for safe high-speed travel.

Above Rear-Dump is being loaded by a 1½-yd. shovel. Loads in the shot limestone usually weigh out at around 19 tons each. Note simplicity of the Rear-Dump body design. Unit has no frame, no sub-frame, no springs or spring hangers, no front steering wheels, no hydraulics . . . hence seldom needs repairs.

Low entry from rear, plus big 9½' x 12' target, speed loading . . . reduce spillage. Triple-layered all-steel body absorbs shocks of heavy, sharply-fragmented rock. High all-steel front guard protects driver, controls. Capacity of this Rear-Dump, without sideboards, is 18 tons. Other models carry 9, 35, and 50 tons.

Hauling shot limestone 4/10 mile from pit to crusher, Rear-Dump reaches 15 mph speeds, despite narrow roads, short sections of 10 to 15% grades and several sharp curves. Tires give adequate traction even on snow and ice. Material being hauled will be crushed into agricultural limestone and road-surfacing.

Waste material is dumped about half a mile from the shovel. Company records show Rear-Dump averages 34 loads per 8-hour shift — as much as the shovel can load. Note how body swings below and behind rear wheels. This keeps material from piling under unit, also allows safe dump over steep banks.

Spoil dumped by the LeTourneau-Westinghouse Rear-Dump and another hauler is leveled by Tournatractor. Other duties for this 19 mph tractor include leveling and maintaining limestone aggregate stockpiles, pulling a 15-yd. scraper to self-load and strip dirt and rock, and pulling a ripper to loosen rocky material.

Tournatractor blade carries 2½ cu. yds. per push. Electric-control down-pressure provides smooth cut. Tires roll without damage over abrasive footing which badly damages crawler tracks. Says Co-Owner C. H. Snyder, "LeTourneau-Westinghouse units just fit our layout. Their maintenance is low and production high."

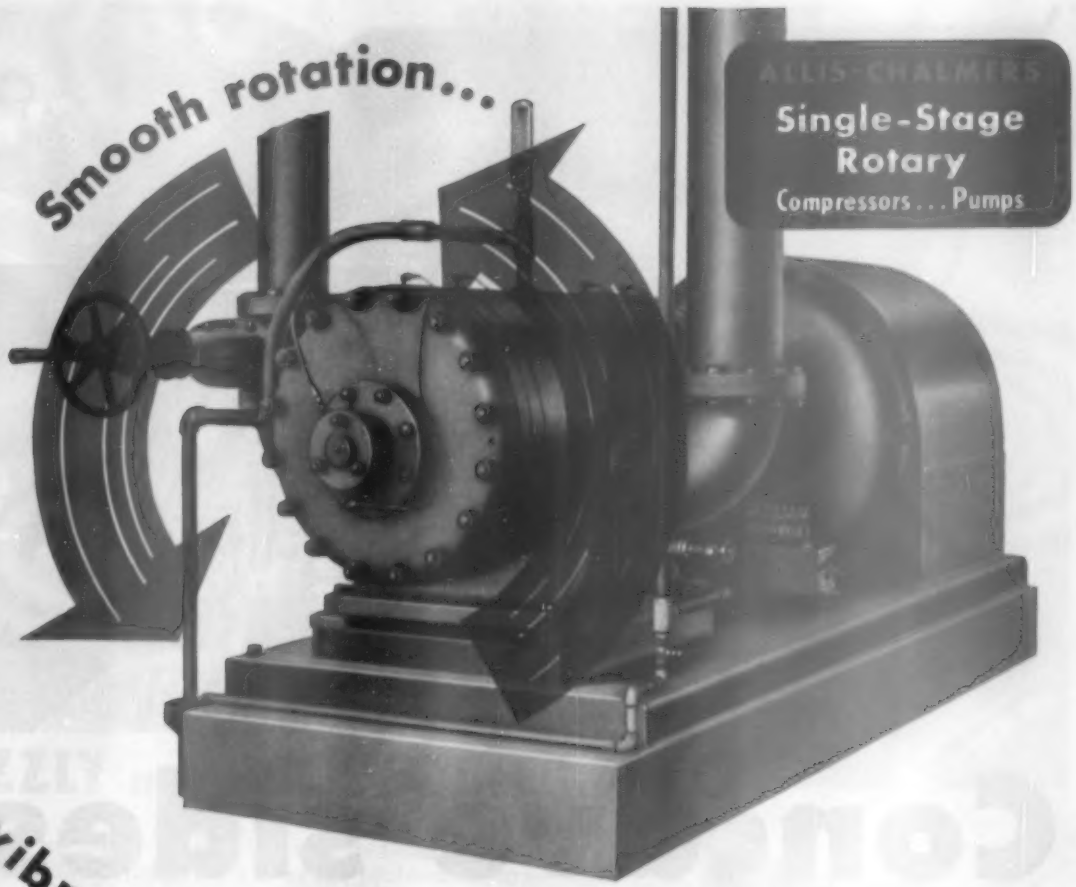
Tournatractor—Trademark TR-662-Q-b

For more information on either Rear-Dump or Tournatractor, please write or call:

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



Smooth running single-stage *Ro-Flo* units eliminate shock and vibration inherent in reciprocating type . . . save wear and tear. But that isn't all!

THERE ARE OTHER MAINTENANCE SAVINGS inherent in *Ro-Flo* design, too. Allis-Chalmers rotary units have no valves and piston rings . . . big source of trouble in many units.

Cuts Foundation Costs

Single-stage *Ro-Flo* units run so smoothly, heavy foundations aren't needed. Small *Ro-Flo* units can be bolted directly to the floor; large ones need only a simple slab.

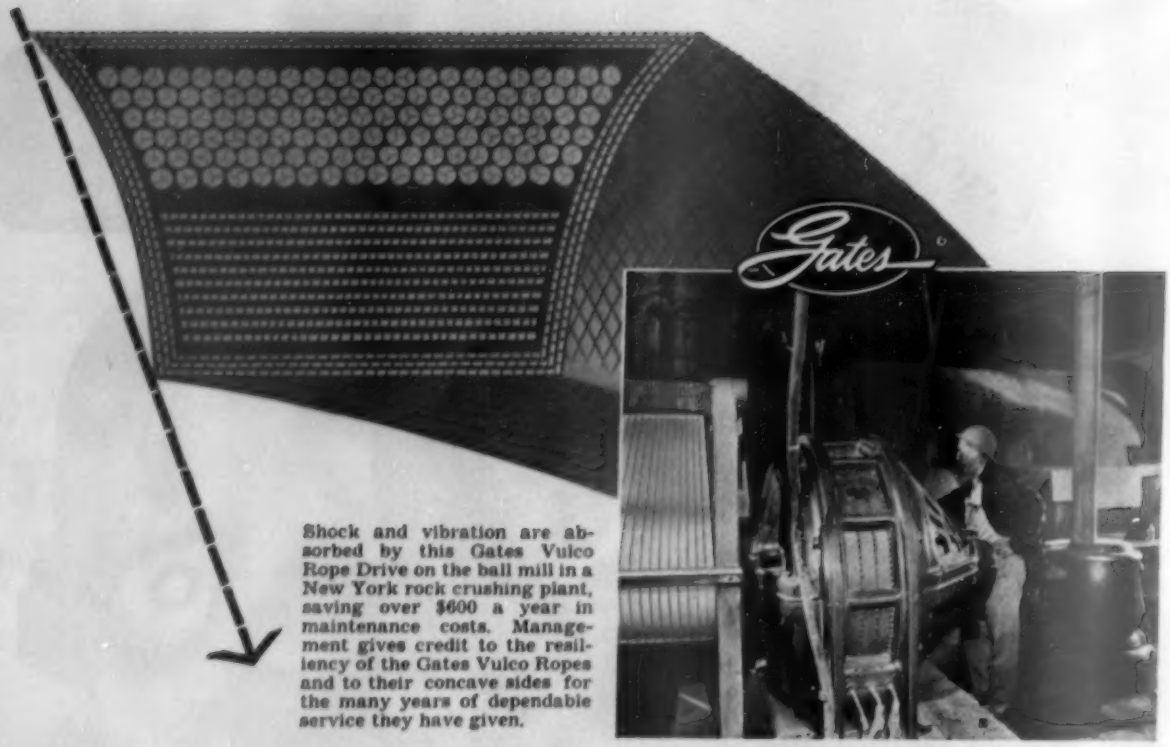
Modernize with rotary Allis-Chalmers units — compact, self-contained! They are built in capacities from 40 to 3200 cfm at pressures from 5 to 50 psig.

Allis-Chalmers can supply motors and control . . . the complete integrated package.

Call your nearest A-C office or write for new 12-page descriptive bulletin 16B8126, Allis-Chalmers, Milwaukee 1, Wisconsin. A-4468

Ro-Flo is an Allis-Chalmers trademark.

ALLIS-CHALMERS



Shock and vibration are absorbed by this Gates Vulco Rope Drive on the ball mill in a New York rock crushing plant, saving over $600 a year in maintenance costs. Management gives credit to the resiliency of the Gates Vulco Ropes and to their concave sides for the many years of dependable service they have given.

Concave sides keep belt costs down!

Industry is saving thousands and thousands of dollars every year by specifying Gates Vulco Ropes—the V-Belts with *concave sides* (U.S. Pat. No. 1813698).

Here's the interesting reason *why* Gates belts save money:

On the bend around the sheave the *precisely engineered* concave sides (Fig. 1) of the Gates belt fill out and become straight (Fig. 1-A). Thus the belt makes uniform contact with the sides of the pulley. That means sure pulling power and *even distribution of wear*. Longer wear, fewer replacements cut belt costs...reduce down time...contribute to profits.

Simple test proves value of concave sides

Bend a straight-sided belt (Fig. 2) and feel the sides *bulge out* around the bend. The bulging sides prevent the belt from fitting evenly in the pulley groove (Fig. 2-A). Uneven contact causes uneven wear...shortens belt life...increases costs.

Keep belt costs *down* by specifying Gates Vulco Rope Drives—the V-Belt with *concave sides*. Belts you need are readily available from nearby distributor stocks. The Gates Rubber Company, Denver, Colorado—*World's Largest Maker of V-Belts.*

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world...

TPA 25-9

GATES VULCO ROPE DRIVES

Fed by Vibrating Feeder, Rock Buster at Karsh Stone Co., Bryant, Ind., turns out 90%-1½" rock at rate of 150-175 TPH. Owner reports gradations of sizes acceptable to most markets.

NO SURGES
NO IDLE EQUIPMENT
with this
GRIZZLY and ROCK BUSTER

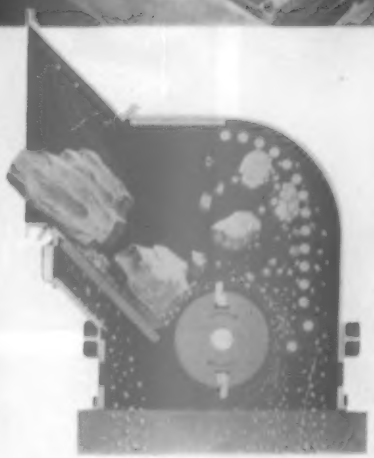
This power-packed Jeffrey Vibrating Grizzly Feeder and Rock Buster Crusher team licks the problem of surges and idle equipment! Aggregate and cement plant operations get smooth and even flow from primary dump hopper to finished cube-shaped product.

The Vibrating Grizzly Feeder (upper left) combines accurate feed control with a rough sizing operation designed to by-pass fines. Won't clog . . . handles large fluctuations in tonnage and feed size without mechanical adjustment.

The Rock Buster (lower right) is a powerful impact-type crusher that can reduce hard friable material from a 36" maximum feed to 90% minus 1½" in a *single pass.*

Crushing elements mounted in a rugged single rotor literally explode rock to top of crusher where it is further broken by impact with heavy rods. Collisions among pieces cause more breaking. A cubical product in various sizes is produced—quickly, and with minimum wear and tear on parts.

What a team! It will increase your profits, lower "down" time . . . best of all, put real flow in your plant by eliminating surges and keeping all equipment busy.



Write for Rock Buster Bulletin 854, Vibrating Equipment Catalog 870

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED
. . .IT'S A JOB FOR JEFFREY!

What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

February, 1955

One of the largest metropolitan rubber-type road re-surfacing projects in the nation has been opened to traffic in Rapid City, S. D. The rubberized paving compound, designated Rubarite, is a free-flowing powder made of unvulcanized synthetic rubber and barytes mineral. Ten of the city's major business streets were resurfaced with the compound, mixed with asphalt and spread in a thickness of 1½ in. A test patch was studied throughout the Winter of 1953-54, and was reported to result in 90 percent less cracking compared to other resurfaced streets. The compound is a product of Rubarite Inc., a corporation owned jointly by Goodyear Tire & Rubber Co., National Lead Co., and Bird & Son, Inc.

An abandoned limestone mine near Pittsburgh, Penn., is being converted into an underground warehouse for the Air Force, at a cost of approximately $5,000,000. The mine requires dehumidification and drainage, but little upkeep is expected, as there are no walls or leaking roofs to repair, and no windows to clean. About half of the 4,000,000 sq. ft. of available storage space will be used for the warehouse, which will include a cafeteria, motor pool, auto maintenance and carpenter shops. The warehouse will also have its own boiler plant, sewage-disposal system, dehumidifier, electrical substation, water supply system, utility lines, and loading docks.

Building shingles, resembling slate, are being manufactured of aluminum, one of the principal elements in slate, by Reynolds Metal Co. A lacquer coating imparts a natural slate color to the shingles, which are claimed to require no paint for weather protection. The product is also reported not to rust, rot, nor cause stains or streaks. The shingles have an interlocking construction, and reflect radiant heat, to keep houses cooler in summer and warmer in winter.

East German potash sales in the United States are being investigated by the Tariff Commission to determine if the sales are injuring or threatening to injure the domestic industry. Six major U. S. companies filed complaints that the Russian satellite was selling potash to the U. S. at lower prices than it charged in other world markets. This, the companies claimed, was seriously cutting into their orders.

Savings as high as 25 percent in wall cost may result from proposed innovations to lessen the cost of materials handling on the job, as reported at the Materials Handling Conference, December 9-10, 1954, held at Kansas City, Mo. This may be an important item in the competition with new forms of wall construction such as tilt-up, skin coverings of metal, and porcelain panels.

Heavy construction awards, nationally, totalled $14,542 million for the year 1954, 2 percent under the 1953 total and 7 percent below the record dollar volume in 1952, as reported by **Engineering News-Record.**

Another use for gilsonite, a kind of solid asphalt, may have been found, according to American Gilsonite Co., which claims to have produced coke from the material. Gilsonite, which is used primarily for making auto batteries, is found only in Utah. The company claims to have developed a method whereby the hydro-carbon is reduced to a liquid form that could be used in a coking plant. The firm is conducting research to determine whether high-quality coke, usable by the Pacific Northwest's aluminum industry, can be produced successfully; and whether economic production can be attained in conjunction with gilsonite mining. Success of the research would provide another outlet for gilsonite, and might result in the building of a processing plant in the Bonanza area, where there are large reserves of the material.

A $11,500,000 test highway in northern Illinois has been approved by state highway officials. It will be a cooperative enterprise, financed by private industry, separate states, and by the federal Bureau of Public Roads. An outdoor laboratory, testing equipment and materials for road construction and maintenance for a dual lane pavement six miles long, extending east and west, north of Ottawa, Ill., are involved in the project. The wear and tear of traffic of different weights and speeds will be measured. Results of the test will aid in determining the portion of public highway costs to be paid by various classes of highway users. The road will become part of U. S. 6, on a new location, when the experiments have been completed in two to four years.

Chemical industry sales during 1954 have kept pace with high levels of recent years, and are expected to be approximately the same as the 1953 record-setting figure of $19.865 billion, as reported by the Manufacturing Chemists' Association. New plants and facilities, costing more than $1 billion, were completed during 1954, according to a survey conducted by the association.

Stiff competition among contractors may result in bringing total costs of the proposed 420-mile Ohio turnpike 10 to 14 percent below previously figured levels. The turnpike, which would run from Cincinnati to Conneaut, Ohio, on a north-south line, with a spur to Toledo, now would cost approximately $448 million instead of the previously estimated $508 million, due to lower bids from contractors.

Lithium mining may be on the increase, due to its growing uses. A great deal is needed for the hydrogen bomb, and it is also used in the form of lithium compounds, in all-weather auto greases, enamels, special kinds of glass, air conditioning and in low temperature batteries.

Materials handling equipment manufactured in the United States during 1954, has been estimated to total approximately $1.25 billion in dollar volume. About 300 to 400 different types of equipment are included, exclusive of equipment for the construction industry and for dirt moving.

Uranium ore has been discovered near Bozeman, Mont., on mineral rights held by Carl Lo Conto of Boise, Idaho, who leased the land from Roy Walton of Bozeman, for vermiculite mining.

THE EDITORS

Why the big operators are buying the UNIVERSAL 880 Senior "R"

No other gravel crushing plant in its weight class can challenge the Senior "R"'s output.

1. **More Tonnage From Screen —** 4' x 12' screen with full 48 square feet of screening area **plus** inclined mounting gives 25% or more output.
2. **Top Primary Output —** Universal 1036 overhead eccentric force feed jaw crusher. The top producing jaw on the market.
3. **Maximum Secondary Production —** 30" x 24" roll crusher. The largest offered in a plant of this weight. Feed design uses the full 24" width of the roll shells.
4. **Big 30" Conveyors —** You need extra wide conveyors to handle the Senior "R"s high output . . . and you get them! Channel frame design for ruggedness — not formed frames.
5. **All This In A Portable Plant —** designed to meet state highway weight restrictions.
6. **Low Initial Cost —** Low maintenance.

NO OTHER PLANT HAS ALL THESE FEATURES

These are but a few of the reasons why the big operators, who keep a careful check on operating costs and production records, buy the Senior "R". Compare it feature for feature with other plants and prove this to yourself . . . UNIVERSAL'S THE BUY! For complete information see your nearest Universal distributor, or write to Universal Engineering Corporation, 631 C Avenue N.W., Cedar Rapids, Iowa.

PETTIBONE
UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION

617 C Ave., N.W., Cedar Rapids, Iowa

A Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division St. Chicago 51, Illinois

One of the most modern operations in the country, Meramec Sand and Gravel Company's new aggregates plant near Pacific, Missouri, combines a master-control, variable-speed conveyor belt blending system with nine Deister Vibrating Screens in the production of 14 sizes of gravel and sand, to meet an infinite variety of specifications to exacting degree.

Deister Type UHS Vibrating Screens—which size up to 400 tons an hour at Meramec, from minus 1½" to minus No. 4—provide faster, steadier, more efficient production through a lifetime unitized vibrating mechanism; opposed elliptical throw; and divided interchangeable screening sections.

All Deister, Top to Bottom

at Meramec's New Plant

Designed to meet the increasing demand for carefully graded aggregates blended to meet the most exacting specifications, Meramec Sand and Gravel Company's new aggregates plant near Pacific, Missouri, is setting a trend for plant design in the future.

And to size the top quality Meramec River Sand and Gravel *faster and cheaper*, Meramec standardized on Deister Vibrating Screens from top to bottom. Their decision was based on long and satisfactory experience with Deister Screens.

Scalping is done with a single deck 4 x 12 Deister, and sizing from minus 1½" to plus No. 8 is done with six double-deck 4 x 12 Deister Type UHS screens and two single-deck 4 x 8 Deister Type SL screens.

Results: Screening efficiency of the *nine Deister screens* is *high;* production volume is *excellent; exacting* specifications are being met; and maintenance has been *less than $50.00* for the first year's operation!

Deister Machine Company — pioneers in the specialized design of machinery for the aggregates industry —offers over 100 models of standard screens for any screening problem . . . in 1, 2, and 3-deck types; sizes from 2½ x 4 to 5 x 14. Write today for complete information.

Sand is sized at Meramec with two Deister Type SL Vibrating Screens in tandem, using 3000 gallons of water a minute. Like all Deister screens, the Type SL's feature fully-cushioned vibration, oil-bath operation, automatic screen cloth tension, and adjustable throw.

DEISTER

DEISTER MACHINE COMPANY

1933 EAST WAYNE STREET, FORT WAYNE 4, INDIANA

From Every Standpoint / output · size · efficiency

Chrysler Industrial V-8 Engines are the best power you can install

Chrysler Industrial V-8 Engines are . . . pound for pound . . . the world's most powerful gasoline industrial engines.

To prove that statement—let's look at the facts. In the charts below, we compare Chrysler Ind. 24A V-8 Engine with similarly equipped products of five principal competitors. Information on each competitive engine is based upon factory specifications. Check the Chrysler advantages—each of them is an important factor in the selection of a power plant.

Engine	Horsepower and Piston Displacement	Pounds per Horsepower	Fuel Consumption—pounds per BHP per hour	Horsepower per Cubic Inch Displacement	
Engine A	110 at 2200 RPM 358 cu. in.	(Stripped Engine) 7.38	.54	.307	**CHRYSLER ADVANTAGES OVER ENGINE A** . . . delivers 18 more horsepower . . . weighs 96 pounds less with 24% less weight per horsepower . . . uses 7.5% less fuel at average operating speed . . . delivers 26% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	128 at 2200 RPM 331 cu. in.	(Stripped Engine) 5.56	.50	.387	
Engine B	104 at 2400 RPM* 330 cu. in.	(Stripped Engine) 6.92	(Information not available)	.315	**CHRYSLER ADVANTAGES OVER ENGINE B** . . . delivers 34 more horsepower . . . weighs 5 pounds less with 25% less weight per horsepower . . . delivers 32% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	138 at 2400 RPM 331 cu. in.	(Stripped Engine) 5.18	.50	.416	
Engine C	99 at 2200 RPM 320 cu. in.	(Stripped Engine) 7.64	.56	.309	**CHRYSLER ADVANTAGES OVER ENGINE C** . . . delivers 29 more horsepower . . . weighs 60 pounds less with 27% less weight per horsepower . . . uses 10.5% less fuel at average operating speed . . . delivers 25% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	128 at 2200 RPM 331 cu. in.	(Stripped Engine) 5.56	.50	.387	
Engine D	117 at 2200 RPM 317 cu. in.	6.5**	.50	.369	**CHRYSLER ADVANTAGES OVER ENGINE D** . . . delivers 11 more horsepower . . . weighs 19 pounds more *but* with 6% less weight per horsepower . . . delivers 5% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	128 at 2200 RPM 331 cu. in.	6.1**	.50	.387	
Engine E	97 at 2200 RPM 372 cu. in.	(Complete Engine) 12.85	.56	.260	**CHRYSLER ADVANTAGES OVER ENGINE E** . . . delivers 31 more horsepower . . . weighs 395 pounds less with 48.7% less weight per horsepower . . . uses 14% less fuel at average operating speed . . . delivers 49% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	128 at 2200 RPM 331 cu. in.	(Complete Engine) 6.6	.50	.387	

**Information not available at 2200 RPM* ***Complete engine less flywheel housing*

These are not just "paper advantages". They show up on irrigation pumps, in construction and road building equipment, in farm combines, and in many other applications. Thanks to modern engineering, hemispherical-design combustion chamber, short-stroke, low-friction construction, Chrysler offers durability and output in amazingly small, lightweight power packages.

And remember Chrysler Industrial Engines can be factory equipped for operation with gasoline, natural or L-P gas.

See a dealer or write: Dept. 142, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.

CHRYSLER
INDUSTRIAL

ENGINES
Horsepower With A Pedigree

INDUSTRIAL ENGINE DIVISION
CHRYSLER CORPORATION

BETTER THAN THE BEST BUT PRICED WITH THE LOWEST

USS Lorain Rolled Plate Linings

point to more profitable grinding for you . . .

SERVICE-TESTED USS Lorain Rolled Plate Linings are designed right and made right of the right kind of steel to save you money on each ton you grind. They cut down considerably on mill "down time" because they last much longer than cast linings and they are so easy to replace when it finally becomes necessary.

There are USS Lorain Rolled Plate Linings made to fit any type of mill—for wet or dry grinding. Be prepared for your next replacement . . . send today for names of leading mill manufacturers who can supply you with USS Lorain Rolled Plate Linings.

USS Grinding Balls can help you get better grinding results, too. They are made of special composition steel to take long, rough wear evenly. Samples from each production lot are thoroughly tested. Available in sizes from ¾" to 5".

1. Plates are interchangeable. Heat treating compensates for localized wear. You get complete grinding value from each plate.

2. Plates made to accurate size . . . go in faster, easier.

3. Tight fit between plates and between plates and lift bars eliminates shell wash and allied troubles.

4. Support for bolt head is near bottom of bar . . . bolts are effective for life of the lining.

5. Lift bars designed for correct cascade action. Height of lift varied to suit conditions.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS LORAIN ROLLED PLATE LININGS *and* USS GRINDING BALLS

4-2286

UNITED STATES STEEL

Oliver "OC-12" with hydraulic 1-yd. loader. This model has the long track frame for added stability. Loader has exceptional bucket rotation and 10' 4" loading height.

Another great tractor by Oliver ...THE POWERFUL "OC-12" CRAWLER!

It's a rugged, eager worker in the 45 drawbar h.p. class that features advancements in power, economy and operating ease to make every job more profitable.

The "OC-12" offers two engines of exceptional torque span—diesel or gasoline. Both engines have instant electric starting, pressure cooling, by-pass thermostat and full-flow oil system to insure quick starting and long, low-cost service.

The smooth lines of this unit show it is made for easy access and operator visibility. Controls are right where they're the handiest. Down to the key-lock switch, foam rubber seat, overhead-linkage clutch, this tractor caters to operator convenience.

Your Oliver Industrial Distributor will be glad to demonstrate the "OC-12." Give him a call.

The "OC-12" is available in two track widths: 44- and 60-inch—and two track lengths, one with four lower track wheels and one with five. Standard grousers are 14-inch.

Here is the "OC-12" with hydraulic bulldozer. Hydraulic pump is front mounted. Special protective grille is part of 'dozer frame. Blade has provision for tilt adjustment.

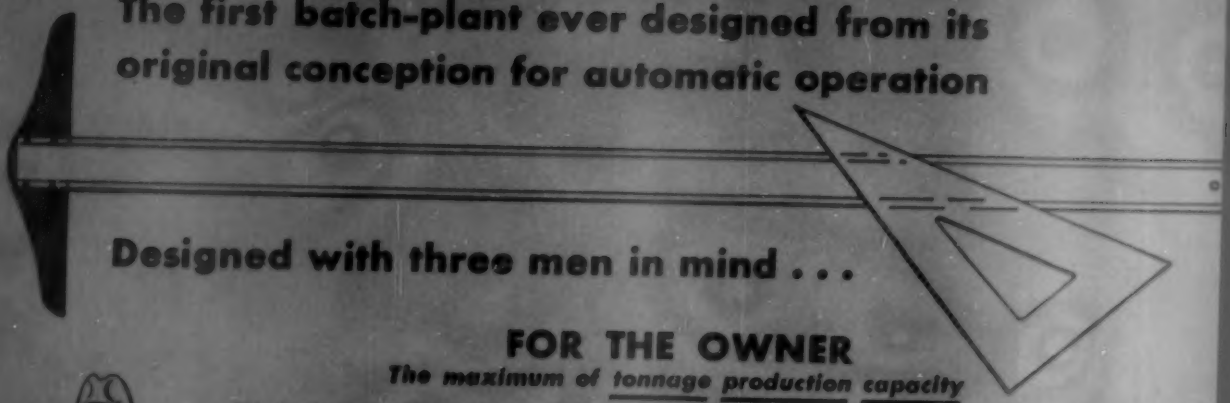
THE OLIVER CORPORATION
400 W. Madison Street, Chicago 6, Illinois

OLIVER

a complete line of industrial wheel and crawler tractors

Barber-Greene

The first batch-plant ever designed from its original conception for automatic operation



Designed with three men in mind . . .

FOR THE OWNER

The maximum of tonnage production capacity

ALL SIZES OF AGGREGATE, INCLUDING THE MINERAL FILLER, ARE WEIGHED SIMULTANEOUSLY. Total weighing time for all ingredients is considerably less than the shortest mixing time in any specification. The only limit on hourly production is the specified mixing time. The completely new pugmill principle gives thorough coating in less time than any other pugmill manufactured today. When a minimum mixing time is not specified, complete coating can be obtained and the tonnage output increased to far above the production of plants of comparable pugmill capacity. Virtually no time lost in discharging. Full-opening bottom gives instantaneous discharge without segregation.

The maximum of flexibility

The plant may be "preset" for all-day production of the same mix in repetitive cycles, and instantly switched for a new mix for the "drive-in" customer. Sooner than the next truck can drive under, the plant is back to its preset proportions and in repetitive cycle operation again.

FOR THE OPERATOR

A new ease and simplicity of operation

Automatic Operation. **With the proportions preset, the operator locks in the "cycle" button when a truck drives under. The plant then automatically goes through complete cycles, including discharging to the truck. If he merely pushes the automatic button (without locking it), the plant goes through the complete cycle up to the point of discharging.**

Manual Operation. **For individual loads or other "drive-in" trade, the operator instantly disengages the preset combinations and weighs out each size of aggregate in ordinary batch-plant fashion. Operating one valve resets the preset proportions.**

Using preset proportions, the operator can manually weigh the materials by either operating one valve to *WEIGH ALL SIZES SIMULTANEOUSLY*, or operating the individual bin valves to weigh each size separately. In either of these cases, *no skill or judgment is required for accuracy.* The preset combinations control the proper weight.

FOR THE INSPECTOR

At any time, the inspector can quickly check the *weight of the asphalt*, the *weight of each size of aggregate*, the *weight of the mineral filler*, or the *weight of the total aggregate*.

The plant automatically extracts a true cross-sectional sample of the aggregate in each bin as part of its regular operating cycle. Normally this sample is fed into the next batch, but at any time the inspector can remove this sample for a gradation check. The plant can be set so that the cycle will be interrupted if there is any variation from the preset proportions.

Batch Plant

Here is the most revolutionary development in the field of bituminous paving since Barber-Greene introduced the continuous plant over a quarter century ago.

When continuous type? When batch type?

The superior performance of the new Barber-Greene Batch-Plant is *not* reason for switching to batch-plants in applications where a continuous-type plant will serve.

No batch-plant, not even the new Barber-Greene, can compete with the continuous plant for highway work, or any application where high tonnage production and portability are important factors.

The basic advantages of the continuous principle continue to exist, and the continuous plant should and will continue to be the most popular.

However, where the batch principle is preferred, primarily for the purpose of serving frequent "drive-in" trade, requiring different mixes during the day, Barber-Greene now offers the outstanding batch-plant of the field.

For years, Barber-Greene has produced more asphalt plants than all others combined. We continue to offer the most comprehensive line of bituminous equipment of any manufacturer.

Automatic Controls

The electric controls are simple 110-volt A.C. circuits. There are *no* electronic devices. The automatic measuring itself is *not* dependent on the electrical controls. If for any reason the operator wishes or needs to operate without the electrical controls, he may do so, and no skill or judgment is required.

55-1-WB

Barber-Greene

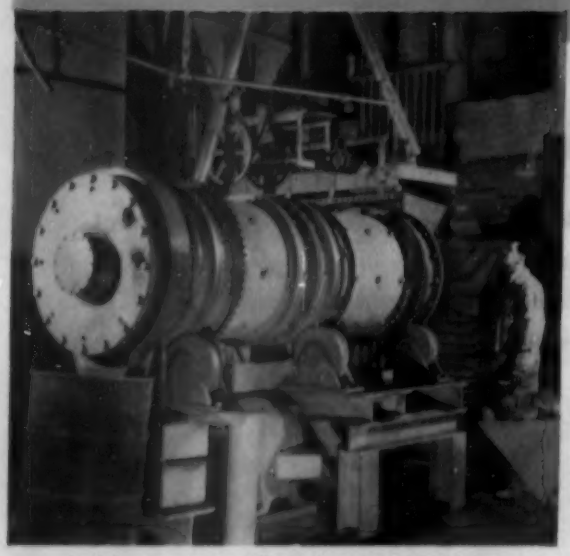
AURORA, ILLINOIS, U.S.A.

WRITE for INFORMATION

descriptive literature . . . sound movies

cost studies . . . nearby job inspection . . . plant layouts

Here's How Industry's Top



Precision tests in the Allis-Chalmers research laboratory determine grinding characteristics and power requirements—accurately predict full-scale performance.

helped increase smelting capacity at the BUNKER HILL & SULLIVAN MINING AND CONCENTRATING CO. Kellogg, Idaho

IN lead smelting, Bunker Hill & Sullivan uses a charge for their roasters made up of limestone, reclaimed slag, lead concentrates and circulating by-products. Realizing that a uniform and porous charge would increase roaster capacity and produce an improved sinter, Bunker Hill & Sullivan decided to pelletize the roaster charge. In order to achieve a uniform mixture and control the pellet size, it was necessary that all materials be crushed to minus ¼ inch, with the bulk of the materials minus 10 mesh. The main charge ingredients requiring crushing consisted of limestone, reclaimed slag and return sinter. Allis-Chalmers was asked to help with this problem.

Here's what Allis-Chalmers did:

Lab Tests The Allis-Chalmers lab team went to work on samples of these three materials. Impact and compression tests were made to determine crushing resistance. Grinding characteristics were established in rod mill grindability tests. Slag was found to be the ingredient most resistant to crushing. The tests also helped determine type and size of equipment needed and power requirements. All this vital information was obtained easily and at little cost.

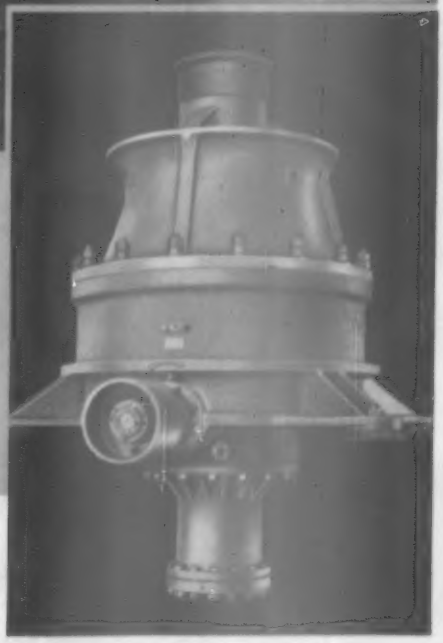
Pilot Plant Run Because an unusually large dry grinding rod mill had been indicated by the lab tests — and to reveal any factors which may have remained hidden in tests on small samples — twenty tons of slag were run in the Allis-Chalmers pilot plant. Evaluation of all test findings by specialized engineers indicated the application of a *Low-Head* screen, *Hydrocone* gyratory crusher and an Allis-Chalmers dry grinding peripheral discharge rod mill for this crushing problem. The equipment is now operating in the Bunker Hill & Sullivan plant where it produces the required finely crushed material for production of pellets.

Help for Your Staff or Consultants The same personal, expert attention is available to you. Your A-C representative, backed by industry's top technical team, is always ready to help you make your operation as efficient and profitable as possible — whether it's a matter of planning a complete plant or merely helping you over an occasional rough spot.

Continuous Service Most important is the fact that Allis-Chalmers interest does not terminate with the installation of equipment. Laboratory facilities, periodic equipment checkup, maintenance, and fast emergency parts service are yours continuously from Allis-Chalmers.

ALLIS-

Technical Team



In the Bunker Hill & Sullivan operation, a 48-in. Hydrocone crusher preceded by an Allis-Chalmers rod deck screen produces a minus ¾-in. feed for the 9 × 12 Allis-Chalmers dry grinding peripheral discharge rod mill which delivers a minus 10 mesh product for pelletizing.

Low-Head and Hydrocone are Allis-Chalmers trademarks.

ALLIS-CHALMERS
Equipment for the
Mining and Rock
Products Industries

A-4402

Crushers — all types
Vibrating Screens — all types — Grinding Mills — all types
Kilns — Coolers — Washers — Dryers — Smelting Equipment

CHALMERS

A-C ALLIS-CHALMERS

For complete information, call your nearest A-C district office or write Allis-Chalmers, Milwaukee 1, Wis.

feed your conveyors RIGHT to control your processing!

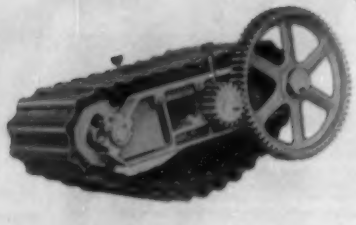
...with REX® Apron Feeders

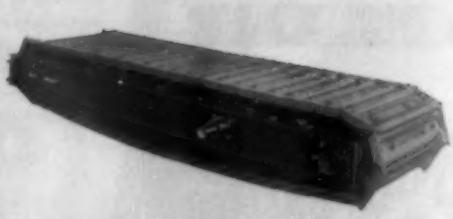
When your conveyors are underfed, you're stepping up costs. You're not getting the capacity you've paid for... subsequent operations cannot be economically controlled!

When your conveyors are overfed, you're wasting money. Following plant operations are economically difficult to balance. And, the wasteful spillage causes unnecessary labor cleanup.

BUT, Rex Apron Feeders, provide the desired, metered rate for all following operations. Rex Apron Feeders are the key units in the close control of plant operations.

Why not have your Chain Belt District Sales Engineer look over your plant with a view to cutting handling costs. Call him or write Chain Belt Company, 4849 W. Greenfield Avenue, Milwaukee 1, Wis.





Typical Handling Operations Where Rex Apron Feeders Can Help Control Processing and Cut Costs

- Coal
- Ores
- Clinker
- Sinter
- Limestone
- Sand
- Cement Rock
- Heavy Chemicals

...and Rex Apron Feeders will handle these materials cold or hot (up to 1900° F.).

Advantages of Rex Apron Feeders

Self-contained...minimum mechanical servicing ...no complicated electrical maintenance.

Sustained efficiency over wide ranges of capacity. Carries material up steep inclines.

Long life. Rex Outboard Roller Construction simplifies maintenance.

CHAIN BELT COMPANY

District Sales Offices and Distributors in all principal cities

High Production and Lower Maintenance–

You Get BOTH with "Eucs"

Built for tough off-the-highway service, Rear-Dump Euclids have increased production and reduced hauling costs on scores of open pit mining and quarry operations. Ability to deliver "plus" performance year in and year out has made "Eucs" the accepted standard for comparison . . . here are some of the reasons why:

RUGGED SIMPLICITY

Designed and built for long life and low maintenance cost. All of Euclid's experience and facilities are devoted to specialized off-the-highway earth moving equipment.

CAPACITY

Euclids have payload capacities of 10, 15, 22, 34 and 50 tons. Because they are matched to various sizes of loading and crushing equipment, "Eucs" provide a well balanced operation for open pit haulage and increase the efficiency of the loading unit.

POWER AND SPEED

Powered by diesel engines of 125 to 600 h.p. "Eucs" have top speeds with full payload, up to 36 m.p.h. Five and ten speed transmission, or torque converter with semi-automatic transmission available. The favorable ratio of horsepower to payload means more pay tons hauled every trip.

VERSATILITY

"Eucs" are efficient for moving any material on any length of haul; handle overburden, rock, coal, ore and other materials loaded by shovels, draglines, transfer hoppers and mobile loading equipment.

If you are interested in higher production at lower cost, have your nearby Euclid Distributor show you what "Eucs" are doing on work similar to yours. He'll be glad to make a hauling cost estimate for your job—no obligation, of course.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

THOMAS PUMP *Increases Production*

Dredge "Sucker" of Associated Dredging Company equipped with a Thomas 14" Durable Pump.

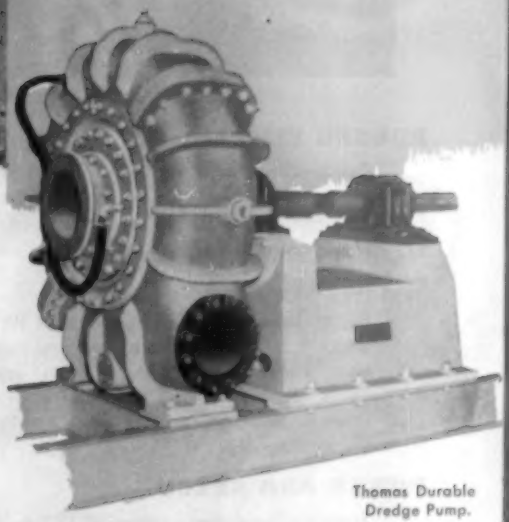
DOWN-TIME—
Negligible!

• • •

EFFICIENCY—
Greatly Increased!

• • •

REPAIR COSTS—
Insignificant!



Thomas Durable Dredge Pump.

They Pay for Themselves

This California pump user, an experienced general dredging contractor, is another of our best boosters. Users of Thomas DURABLE DREDGE Pumps, like him, are our best volunteer salesmen. Read his letter at the right, to which we would like to add this thought:

Superior design of Thomas Pumps is not alone responsible for their low maintenance and long life . . . instead it is the combination of improved design, the use of oversize shaft and bearings, and the use of modern, ABRASION RESISTANT material (Thomas NI-HARD) in their manufacture that makes the difference. Thomas pumps are designed for NI-HARD, designed to outlast conventional pump materials.

No wonder Mr. Rich plans to replace all of his pumps with Thomas Durables. He, like others, has found that Thomas Pumps *pay for themselves* . . . through increased production . . . through reduced down-time for repairs . . . through minimized repair bills.

How would a check list on your pumps doing general dredging or handling sand and gravel compare with this experience of Associated Dredging Company?

Can you afford to continue using pumps that are less efficient or less durable or cause excessive down-time for repairs and frequent maintenance, when more efficient, more productive, longer lived, proven and dependable Thomas Durable Dredge Pumps are readily available?

THE FIRST COST OF A DREDGE PUMP IS OF LITTLE CONSEQUENCE

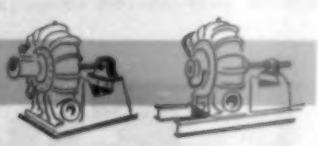
Consider instead: How much material it pumps . . . cost of repair parts . . . cost of maintenance labor.

Thomas Pumps are not the lowest priced but you can't beat their over-all low production cost.

If you do it with a Dredge Pump, you can do it better and cheaper with a "Thomas".

THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA



Read this Letter
FROM CALIFORNIA

ASSOCIATED DREDGING COMPANY

PHONE SAUSALITO 70
1702 BRIDGEWAY BLVD.
SAUSALITO, CALIFORNIA

October 8, 1954

Thomas Foundries, Inc.
P. O. Box 1111
Birmingham 1, Alabama

Gentlemen:

A number of months ago we replaced the pump on our dredge "Sucker" with one of your 14" Thomas pumps. It was immediately apparent how much more efficient this pump operated than our old pump. Production of our dredge has increased so materially that we have just finished two jobs in about one half the time that we had estimated.

We have operated different makes and styles of pumps in all sizes from 6" to 20" on various dredges of our own. These pumps have been made of almost every material from cast iron to manganese. It has been quite surprising and pleasing to us to operate this Thomas pump and check our repair costs against our normal experience. In six months of operation with the Thomas pump we have replaced only two rubber seal rings whereas normally we would have completely rebuilt the liners and impellers of any other pump. The time lost in dredge operation for pump repair has been so small that it is completely negligible.

I believe that a good portion of this low maintenance cost is due to the oversize shafts and bearings with which your pump is built. It is our intention to replace, in the near future, some of the pumps on our other dredges with Thomas pumps of equal size.

Again I wish to reiterate that we are convinced that the low maintenance cost produced by your pump is due to it's superior design. We had not thought it would be possible to design a pump which would accomplish this so materially.

Sincerely yours,

ASSOCIATED DREDGING COMPANY

R. E. RICH, Vice-President

RER/bd

3600-rpm explosion-proof motor with fan housing removed to show unidirectional fan.

These heat exchanger tubes

Protect this motor from dirt and corrosion

COOLING AIR is carried through the heat exchanger tubes with sufficient velocity to expel practically all kinds of dirt. If oily or sticky dirt should cling, tubes can be ramrodded clean on the spot in a few minutes because tubes are straight and tube ends are exposed. Also, the tubes are distributed uniformly around the perimeter of the stator yoke and along its full length — cooling all parts of the motor evenly.

Choice of Corrosion-resistant Materials

You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

Get Complete Information

Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

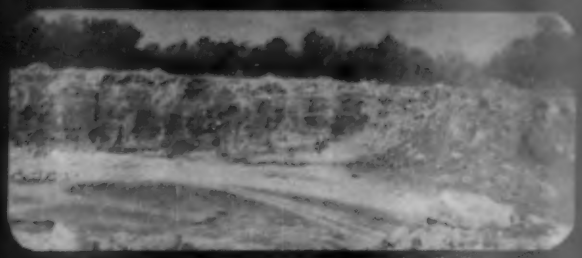
A-4559

ALLIS-CHALMERS

Are you getting results like this?

MISSION: Move a 22' limestone burden off this 57' quarry face. Get good breakage, good control of throw. But hold noise and vibration to a minimum.

METHOD: Shoot it with ROCKMASTER® milli-second delay caps and APEX® "cored" explosives.



Combination shot. Alternate blast in center gives the "one-two" punch. Progressive blasts at both ends wave down face . . . tear away rock with minimum vibration. Good bottom breakage.

Excellent confinement. Excellent control. No visible air blast. Muck pile shows good fragmentation. Well spread for easy-digging.

To look at these photographs, you'd hardly recognize a "blast" taking place. Where are the big explosion, the clouds of dust and smoke, the flying boulders? You don't see them! That's real blasting efficiency!

And this is the rule—not the exception—at Pallette Stone Corp., Saratoga, N. Y. Shooting with ROCKMASTER milli-second delay caps at the bottom of the holes, the blast is confined to the burden. The explosives go to work on the rock—not the air. Here's a ready-made, workable muck pile...easy bite for the shovel, easy work for the crusher.

You may be able to get results like this, too. Ask your Atlas representative about ROCKMASTER, the safe, modern method of delayed-action blasting that gives you better breakage with less "blast."

BLAST DATA:

Height of face	57'
Burden	22'
Number of holes	12
Diameter of holes	6¼"
Depth of holes	62'
Spacing	24'
ROCKMASTER delays	2 & 3
(Alternate pattern: Apex #3 LV)	
Stemming	15'
Powder factor	3.2
Total tons	30,559
Total explosives	9,325 lbs.
Loading starting	8:00 AM
Loading finished	1:00 PM
Blast fired	4:10 PM

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY.
WILMINGTON 99, DELAWARE

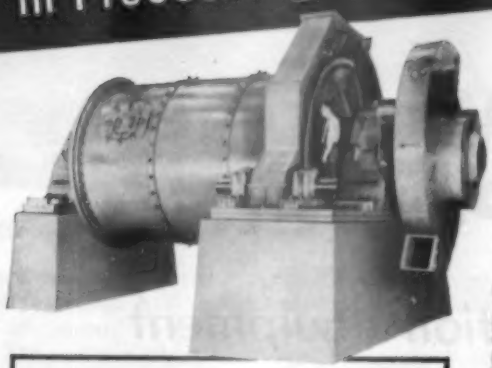
Offices in principal cities

GET "BETTER BLASTING"

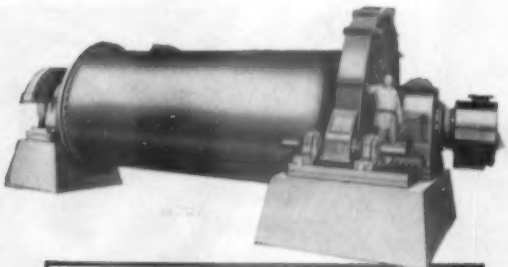
If you are not already getting this informative periodical, let us put your name on our mailing list today.

(P. S.—Tell us who else in your organization should get "Better Blasting", too.)

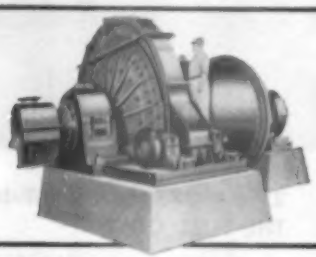
Dependable—Precision Built
NORDBERG GRINDING MILLS
Assure Maximum Output—Low Costs in Processing of Ores, Minerals and Cement



NORDBERG 10′-8″ x 17′ Wet Grinding Ball Mill showing scoop feeder.



NORDBERG 9′-6″ x 24′ Wet Grinding Pebble Mill for non-ferrous milling.



NORDBERG 9′-6″ diameter x 11′ long Dry Grinding Mill.

MORE than half a century of progressive engineering achievement, combined with quality production in modern manufacturing facilities, have won for Nordberg a foremost position in the field of heavy machinery manufacture.

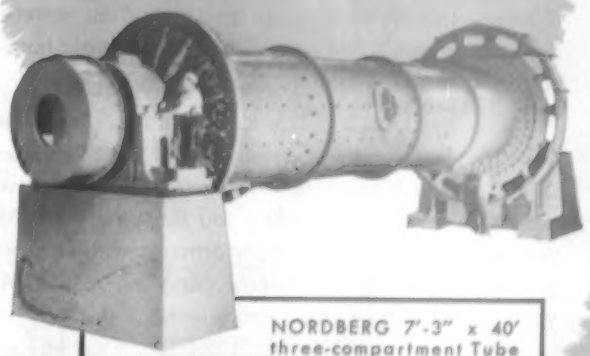
Typical of this heavy machinery is the complete line of Nordberg Grinding Mills available for the manufacture of Cement, the extraction of Metals from Ores, and in the processing of Non-Metallic Minerals, which require comminution to fine sizes.

Nordberg manufactures Ball, Tube, Rod and Compartment Mills, of grate, overflow and peripheral discharge types for wet or dry grinding service, in sizes ranging to 13′-0″ diameter, and in lengths to 40′-0″.

Competent engineering services are available for new processing plant design or modernization of existing plants.

For large or small operations, you can depend on Nordberg Machinery to deliver maximum output at lowest possible cost.

NORDBERG MFG. CO., Milwaukee, Wisconsin



NORDBERG 7′-3″ x 40′ three-compartment Tube Mill manufactured for a large cement plant.

SYMONS GYRATORY CRUSHERS

SYMONS CONE CRUSHERS

SYMONS VIBRATING GRIZZLIES

SYMONS VIBRATING SCREENS

DIESEL ENGINES — 10 to OVER 10,000 H.P.

GM154

SYMONS . . . A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

NORDBERG MACHINERY

NORDBERG

CRUSHERS SYMONS SCREENS

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

Like these contractors, you can

Bid lower- Finish jobs faster- make more per contract

SPECIFY GENERAL MOTORS DIESEL POWER

In all your construction equipment

"Works faster... burns less fuel... costs less to maintain."

That's what these contractors—operating *seven* different kinds of General Motors Diesel-powered equipment—report about their GM Diesels. They've got on-the-job proof that a GM 2-cycle Diesel does more work at less cost on every construction job.

If your business is building anything from sewers to skyscrapers, you'll find a good way to build your business is to *specify* a GM Diesel when you buy equipment.

For this quick-acting 2-cycle Diesel accelerates faster under load, burns fewer gallons of low-cost fuel, stands up better even in toughest working conditions. You won't need service often but, when you do, your GM Diesel distributor backs up engine performance with fast service and quick delivery of low-cost parts, no matter where your contracts take you.

Today you can get GM Diesel power in over 750 different models of equipment built by more than 150 different manufacturers. Get their names from your local GM Diesel distributor or write direct for the list.

25% MORE WORK AT HALF THE FUEL COST

California contractors McGuire & Hester report they're getting 25% more work—and spending 50% less for fuel—since they converted this ¼-yard dragline from *gasoline to General Motors Diesel power*. The compact "4-71" GM Diesel did such a good job that the contractor repowered two more shovels with GM Diesel.

GM
GENERAL MOTORS
DIESEL POWER

WORKS ⅓ FASTER—CUT FUEL COSTS 60%

Maryland contractor Charles F. Knox, Jr., reports he gets ⅓ more production, has cut fuel costs 60%, since he converted this ¾-yard shovel from *gasoline to GM Diesel power*. The shovel works 8 to 10 hours a day, costs far less to maintain. You can specify GM Diesel power in over 50 shovel models built by more than 20 manufacturers.

PAVES 1400 FEET A DAY

This Koehring Paver, powered by a compact, quick-accelerating GM 2-cycle Diesel, lays 1400 feet of 25-foot wide pavement per day for the Austin Road Company of Dallas, Texas. You can lay pavement faster and at less cost with GM Diesel power—available as original equipment in 8 paver models made by 4 different manufacturers.

"FASTEST DITCHER IN THE AREA"

McGuire & Hester *specified* GM Diesel power in two new Buckeye Ditchers and a Lorain Crane, as well as repowering a Hough Payloader, after getting *more work at less cost* with GM Diesel power in their dragline. The master mechanic calls this GM Diesel-powered Buckeye Ditcher "fastest in the area."

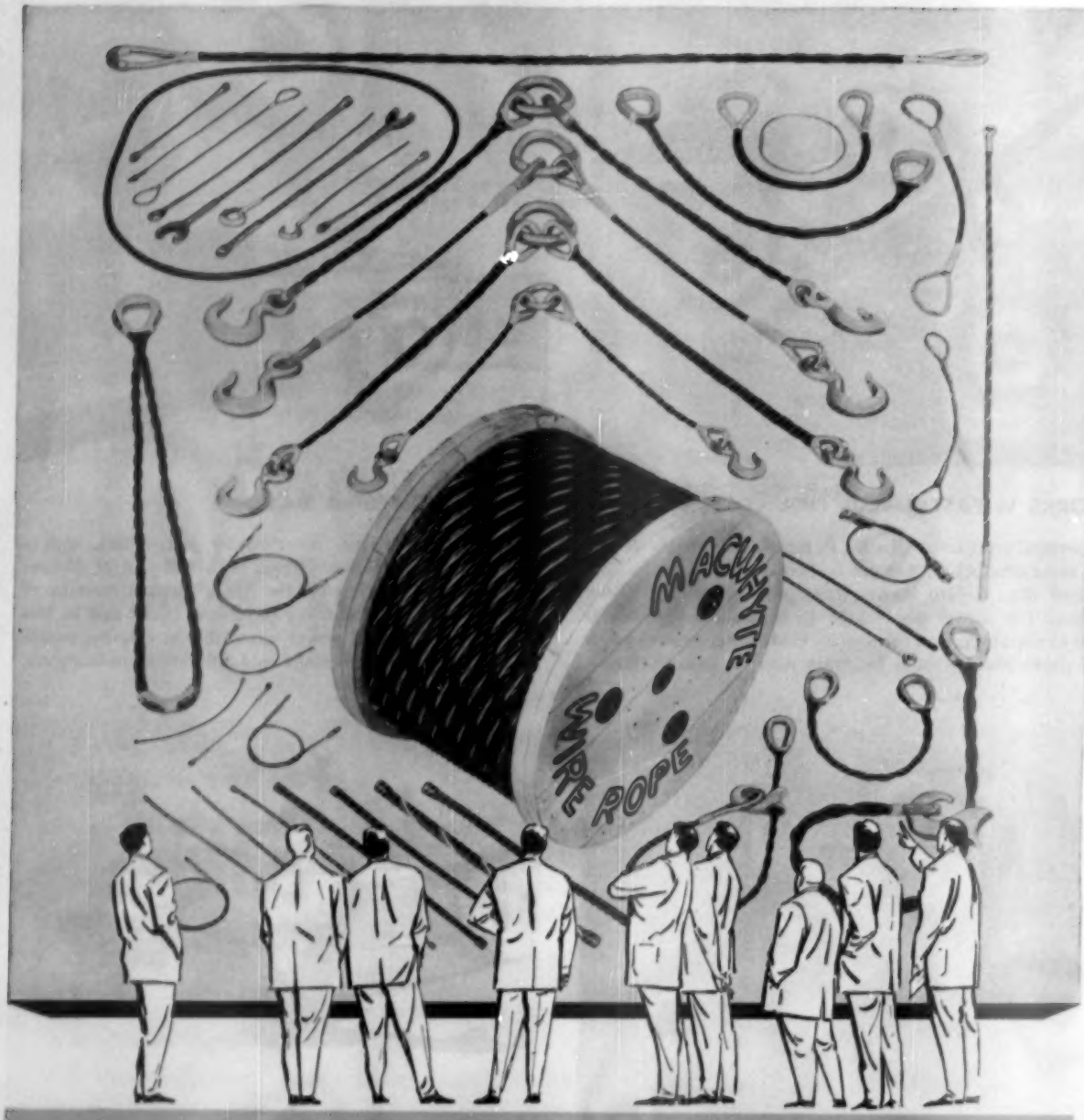
NO REPAIRS IN TWO YEARS

These GM Diesel-powered LeTourneau-Westinghouse Tournapulls worked over two years in flying abrasive dust without losing a day for repairs, reports Arizona contractor Link L. Colvin. In every kind of earth-moving equipment GM Diesel power lasts longer, works faster, costs less to run and maintain.

DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 30 to 300 H.P. • Multiple Units . . . Up to 893 H.P.



These ropes, slings, and assemblies provide a big selection for your needs

Shown above are Wire Rope products developed and manufactured by Macwhyte Company for maximum safety and economy. There are a thousand and one types and sizes of Wire Rope in Bright Steel, Galvanized Steel, Stainless Steel, and Monel Metal; hundreds of types and sizes of Braided Wire Rope Slings for materials handling; a wide selection of Wire Rope Assemblies for machine parts and controls; and Aircraft Control Cables, Assemblies, Terminals, and Tie-Rods for aircraft and other uses.

All these products are available from Macwhyte Company and distributors. Recommendations will be gladly furnished. A Macwhyte distributor will be pleased to serve you or write direct to:

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Galvanized, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies. G-16 Wire Rope Catalog available on request.

Mill depots: New York • Pittsburgh Chicago • St. Paul • Fort Worth Portland • Seattle • San Francisco Los Angeles

Distributors throughout the U.S.A.

MACWHYTE COMPANY, 2949 Fourteenth Avenue, Kenosha, Wisconsin

EDITOR'S PAGE

Census to Establish New Comparative Figures for Industry

ONE OF THE MORE IMPORTANT ACTIVITIES of the federal government, as far as industry benefits are concerned, is the census of businesses now being taken by the U. S. Census Bureau. As this is written, the necessary forms have been mailed or shortly will be in the hands of all producers in these industries, requesting a great deal of information about their individual businesses for the purpose of statistical summary.

The census of mineral industries, covering 1954 operations, will be the first to have been compiled since 1939. The 15 years that have transpired have been years of startling change in the economy and the resulting statistical analyses will establish new bases for comparisons of performance that will surely be startling.

There are many companies that still refer to the now hopelessly out-of-date 1939 census figures as norms for the purpose of comparing their progress with what has been considered a "normal" business year.

It is hoped that all producers in the rock products and concrete products industries, though they may be sick and tired of government forms, give conscientious attention to the census forms and that they be accurately filled out and returned within the allotted time. The quality of the census depends on the data submitted from reporting companies.

Data requested include the identification of a mine or property, description of the nature of operations, statements of company ownership, employment and payrolls, man-hour breakdowns according to work classifications, costs for supplies, fuels, electrical energy and machinery, the horsepower ratings for powered equipment, capital expenditures and other significant facts.

Such information from any company is not to be revealed and comprises a program in which individual concerns, government agencies and trade associations have cooperated so that the resulting statistical data may be useful to industry. The resulting tabulations and analyses will be working tools for use between censuses and will be the only information of that type available from any source. This is the type of information to which trade associations and other agencies must often refer in answering thousands of questions.

Analyses will provide detailed, measurable data for all industries and businesses by states, metropolitan areas, cities, counties and statistics on fuel, power and other measurable factors. Much of the data will provide businessmen with facts that may be important guides in the development of markets and in the making of decisions to meet the ever-changing business picture.

It is expected that many individual businesses will find use for the facts to be developed, in decisions on plant locations and expansion, product development and in the establishment of sales quotas, advertising campaigns and other guides to the conduct of business.

Basic facts such as these can have an important place in preparing for future problems including the determination of the size of prospective markets, in analysis of the competitive picture, and in ascertaining the availablity of materials, supplies and workers.

In view of the unprecedented growth of the population and the great progress in technology and mechanization since the 1939 census, the 1954 census should provide opportunity for the evaluation of capital investment in terms of increased production per man-hour to determine whether recent plant modernization has been justified. Individual companies can determine if they have kept pace with the times and how they have compared with averages for the industry in terms of productivity, capital expenditures, the use of fuels and power.

Comparisons with similar activities elsewhere should help disclose opportunities for improvement and, in many cases, indicate the competitive position of a company. As markets continue to become more competitive, with increasing emphasis on price, there can be no denying that the taking of the necessary steps to increase productivity is an increasingly important function of management.

Comparisons, such as the current census would provide, should help point the way to the required capital investment in production facilities in order to increase productivity to the necessary level, competitively, and to evaluate such expenditures in terms of increased productivity versus wage rate increases.

The trend in population indicates that the labor force available in the years ahead will increase by smaller numbers than required to produce needs for the increased total population so all industry will be faced with the need for increasing output per man-hour. Only with the use of efficient machinery in modern plants will it be possible to meet demands with fewer available workers.

The 1954 census will show the extent to which productivity was increased with technological advances. Every businessman should participate in accumulating the facts and then take stock on how he compares with the averages for his industry.

Bror Nordberg

Dempster-Diggster bucket GETS A FULL LOAD WITH EVERY STROKE!

The hydraulic crowd and hoist operation of the new Dempster-Diggster GRD-101 gives you big shovel advantages in front end loading and excavation work. As shown in the at-work photos at right, here's what happens: Dempster-Diggster moves into material with shovel lowered against front of frame. No wheel traction is used to get excavation power. The hydraulic crowd and hoist moves bucket out and up following contour of material—getting a full bucket with every stroke . . . reducing loading time and idle truck time, thus getting the job done faster!

When you put your Dempster-Diggster into operation, one of the first things you will find is that your entire operation must be geared to a faster pace. This means greater efficiency of equipment and manpower—more profit to you!

Write us asking for Folder No. 3116 giving you complete information on the features of the Dempster-Diggster, including TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MAXIMUM DUMPING AND DIGGING HEIGHT . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING, etc. Manufactured by Dempster Brothers, Inc.

In photo below camera catches Dempster-Diggster ready to back off and move up to a truck for loading.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS, 325 N. Knox, Knoxville 17, Tennessee

Must Still Guard Against More Inflation

ROCKY'S NOTES

NATHAN C. ROCKWOOD

APPARENTLY PROSPECTS for producers and manufacturers of construction materials were never rosier than at the moment. All who have published trends and developments agree on that. They also generally agree that productive capacity is catching up with prospective demand; that the emphasis will be on competitive selling and on individual cost economies; the same, of course, as is predicted for all industry. The outlook would be clearer if there were more liklihood of a stable dollar value. However, it is hard to see a stable dollar ahead with continuing deficits in the federal government financing and growing debt, public and private; and even more so in the constantly rising level of wage rates under union labor pressures.

Organized labor's objectives for 1955 appear to be better planned and financed than industry's, and they are more popular. Among these objectives is a minimum wage of $1.25 an hour. Labor spokesmen probably do not expect that much and would settle for $1.00, or possibly the 90¢ that the federal administration is proposing. It is doubtful if much of any union labor works today for less than $1.00 per hr., but the majority of workers are still outside unions and employed in local shops and stores, the cost of whose products and services are important factors in the cost of living. At present many of these workers do not come under the Fair Labor Standards Act, but the federal administration aims to find a way to bring them in. Hence, an increase in those costs will furnish fresh arguments for increases in union labor scales. And there is every indication that union bosses intend to go on seeking higher and higher wage rates; they seem to believe it is their only chance of holding their own jobs.

On the other hand, organized labor, according to the heads of the C.I.O. unions, is seriously concerned with the progress of what is now called "automation," or the constant introduction of automatic machinery to replace man-hours of labor. For example, a committee report to the recent C.I.O. convention of delegates in Los Angeles, Calif., brought out the information that the Ford Motor Co.'s engine plant in Cleveland, Ohio, through the introduction of new automatic devices, makes possible the drilling of all the holes in a crank shaft with only three machines and nine employes, while the conventional machinery required 29 machines and 39 employes. It was estimated that the United States Steel Corp.'s new Fairless works in New Jersey will produce 2,100,000 tons of steel ingots with about 6500 workers, while at its older plants some 70 percent more employes would be required for the same tonnage.

Cheap Money—High Cost Labor

What labor leaders do not comprehend, or at least will not admit, is that such automation is greatly speeded by demands for constant and unjustified (economically) wage increases. When wages are high and workers in a refractory mood, and money is cheap (that is money or credit can be had at low rates), there is every inducement for employers to seek and install more automatic machinery that will replace labor. The prospect of more inflation (or deflation in dollar values) increases the desire for investment in machinery because of the expectation of paying off debts in cheaper money. Yet cheaper money hurts labor in some very important ways because it reduces the purchasing power of pensions, and all the other social service benefits such as unemployment insurance. The only cure for automation the C.I.O. leaders can see, apparently, is to petition Congress for an investigation with the object of preventing serious displacement of labor, and to maintain and "increase mass purchasing power."

Employers Need Caution

Of course, in the long run, as the "industrial revolution" has always shown, labor ultimately benefits from automation, but labor is required to make and service the new automatic devices, but the change, nevertheless, does result in disorganizing established institutions, such as the particular labor union involved. The way the C.I.O. leaders would have the government maintain and increase mass purchasing power, other than doing something to arrest automation, is to increase unemployment compensation payments. However, it seems to us that it is also illogical because higher unemployment pay would only increase the desire of employers to eliminate unnecessary employes, since unemployment compensation taxes are based on payrolls.

One of the ways the C.I.O. would meet the automation problem is to limit labor union contracts to one or two years duration, but this merely introduces another unstabilizing element into the economy, and a degree of stability appears to be the chief missing link in an otherwise picture of continuous prosperity. It is unlikely that wage increases in 1955 will be as easy for labor unions to obtain as they have been in the recent past. Labor leaders would be more logical to concentrate on ways and means to hold on to what they have already gained. Many employers have yet to learn what the various fringe benefits they have been induced to sign for are really going to cost in terms of the price of their products, if these are to be sold at a profit to the company.

G. E. Morse, vice-president in charge of industrial relations, Minneapolis-Honeywell Regulator Co., speaking at the December Congress of American Industry on the subject of indirect labor costs, said that recent surveys showed that many employers have little idea what the product cost is for some of the many fringe benefits they are paying out money for. Many do not even keep sufficient records to find out. He said such employers would be fatally handicapped in union labor bargaining, and would be without the means to maintain their competitive position in their industries. He especially cautioned against the practice of merely following an industry pattern, because costs do vary among plants in the same industry, and these indirect cost items may be a considerably greater percentage of cost in one case than in another.

Mr. Morse said it was a myth to believe that fringe benefits in labor contracts are easier to reduce than wage scales. He added that fringe benefits actually became more costly as time goes on. He gave an example of a contract which gave the employer the right to ask employes, if they were able, to continue to work after the age of 65 before retiring them under the pension plan adopted. However, because of the prospect of slack employment, the union has demanded that

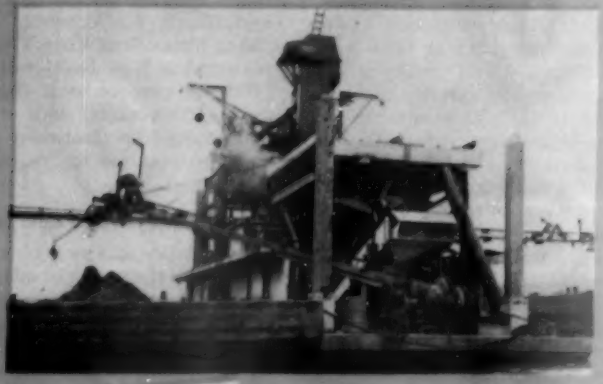
(Continued on page 124)

WASHING-CLASSIFYING "OVERHEAD" IS LOW WITH THESE EAGLE UNITS MOUNTED OVERHEAD ON DREDGES!

A number of material dredging operators have recognized the advantages offered by on-board screening, washing and classifying of dredged material versus pumping to a shore plant. Besides eliminating much discharge piping and need for extending it as dredge changes position, barge loading is simplified. Three typical dredges, with on-board washing-classifying plants are shown here.

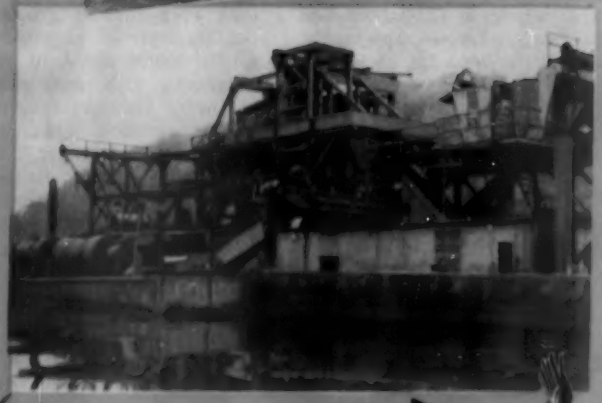
Harry Zubik Co.
Pittsburgh, Pa.

Overhead Eagle equipment which cuts "overhead" in this dredge consists of Eagle 24' Double Water Scalping Tank and a 30" x 22' Long Weir, Double Screw, Fine Material Washer-Classifier-Dehydrator. This dredge is also equipped with an Eagle "Swintek" Traveling Screen Chain Dredging Ladder which cuts dredging costs.



Big Rock Stone & Materials Co.
Little Rock, Ark.

This Arkansas River dredge employs three Eagle 24" x 22' Double Screw, Fine Material units—each producing a different gradation of material. Barges conveniently loaded from the side of dredge, directly from chutes on washers.



Duquesne Sand Co.
Pittsburgh, Pa.

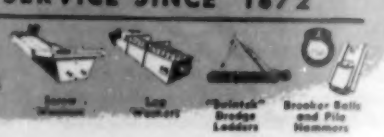
Duquesne's dredge "Admiral" is equipped with double 32' water scalping tank and 36" x 25' double screw, fine material unit—the combination that assures clean, graded materials. The "Admiral" is also equipped with a 12" x 65' heavy duty "Swintek" dredging ladder.

Send for Eagle Washer Catalog 54. Catalog 83 covers Eagle "Swintek" Dredging Ladders.

EAGLE IRON WORKS
137 Holcomb Ave., Des Moines, Iowa

EAGLE IRON WORKS

EXPERIENCE-PROGRESS-SERVICE SINCE 1872



By NATHAN C. ROCKWOOD

Paying Truck Drivers By Trip Rate

A RECENT DECISION by an examiner, Public Contracts Division, U.S. Department of Labor, may prove of interest to producers in our industries who have to make long motor-truck hauls. It has the effect of standardizing haulage costs for such operators without elaborate records of time required at hourly wage rates plus overtime; and, according to the decision, can be applied either to one's own truck drivers or to contract haulers who do not come under the Interstate Commerce Commission's provisions of the law governing common carriers.

While this decision applies specifically to the application of the Public Contracts Act (Walsh-Healey Act) there appears to be no reason why its application would not extend to the Fair Labor Standards Act (Wage and Hour Law). The Public Contracts Act is of similar character but more severe than the F.L.S.A. in that overtime must be paid for hours worked in excess of 8 hrs. in any one day regardless of the 40-hr. week standard. Rock products producers and manufacturers also operate frequently under the Public Contracts Act, which applies to contracts of the United States for the manufacture or furnishing of materials, supplies, articles or equipment in amounts in excess of $10,000. Penalties for violation are severe.

Haulage on Piece-Work Basis

The case in point is that of E. Van Dornick, doing business as the C. A. Krebs Oil Co., Los Angeles, Calif., who had a contract to supply gasoline to the Nellis Air Force Base in Nevada, which required a long haul — on the average, the round trip, about 16 hours. That is, of course, a longer haul than would be common for rock products materials, but we see no reason why the same reasoning could not be applied to a trip rate base set up for two or more trips per day, or so many per week. What the decision does is to put motor truck haulage on a piece-work basis, where the cost is standardized, and an incentive is provided to make deliveries as expeditiously as possible.

The complete text of the decision (without the reference notes) in the language of the examiner (Parkinson) is as follows: "In this proceeding under the provisions of the Act of June 30, 1936 (49 Stat. 2036; 41 U.S.C. 35-45), otherwise known as the Walsh-Healey Public Contracts Act, the respondent is charged with requiring and permitting persons employed in the performance of contracts subject to the Act to work in excess of eight hours per day and forty hours per week, and with having failed and refused to pay such persons for such excess hours, the overtime rate of one and one-half times their basic hourly rates as required by said contracts and by Sections 1 and 6 of the Act and by Section 201.103 of the Regulations (41 CFR, Part 201), promulgated by the Secretary of Labor under authority of the Act.

"The respondent filed no responsive pleading to the complaint, but a stipulation and discussions had at the hearing and the briefs establish that truck drivers were paid on a trip basis and worked overtime. Having done so, the issue which developed was whether or not the truck drivers were paid the required premium for this overtime work. Specifically, the principal issue here is whether or not any part of the sums paid as wages should be credited to the respondent as overtime. Because the preponderance of the evidence establishes that some bona fide overtime was paid, respondent's defense on this issue is sustained.

Facts in the Case

"Based upon the entire record, the following findings of fact, conclusions of law, and decision hereby are made:

"(1) The respondent, E. Van Dornick, during the period from prior to July 1, 1953, to January 15, 1954, and thereafter, operated a refining and marketing business, under the name and style of C. A. Krebs Oil Company, having his place of business at 4600 Worth Street, Los Angeles, California.

"(2) The respondent, E. Van Dornick, was awarded by the Government of the United States, the following contracts on the dates, in the amounts, and for the commodities set opposite each of them:

Contract No.	Date Awarded	Commodity	Amount
ASP 7197	6-26-53	Aircraft fuel JP-4	$1,803,200
ASP 7197 (Revision)	10-19-53	Aircraft fuel 91/96	232,500

"Each of the said contracts was subject to and contained the representations and stipulations required by the Act.

"(3) The commodity specified in each of the contracts identified in paragraph 2 was manufactured at 4600 Worth Street, Los Angeles, California, by respondent and delivered to the Government at Nellis Air Force Base in the State of Nevada.

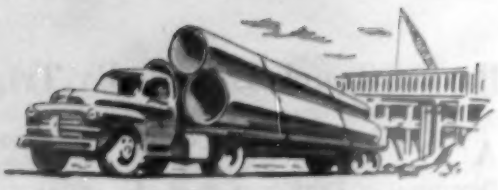
Trip Rate Calculation

"(4) The truck drivers were paid a trip rate of $47.00, plus $2.07 per hour for various non-driving activities. This hourly rate was taken from the area industry-wide union agreement for straight-time driving, and figures prominently in not only the rate for non-driving, but also in the trip rate for drivers. On the one hand, it is the Government's theory that all amounts paid constitute straight-time compensation; that no overtime compensation was paid; that the basic rate for overtime purposes is properly arrived at by dividing total weekly hours into total weekly straight-time compensation; that an additional half-time at the basic rate thus arrived at is owing and unpaid for each overtime hour during each of the workweeks throughout the period involved. On the other hand, it is respondent's position that the trip rate paid was more than ample to satisfy the overtime requirements of the Act.

"In establishing the trip rate the respondent Van Dornick took into account the actual mileage and the estimated driving time. He testified that he used the most straight and overtime hours per trip which might be required. Thus, when arriving at the $47.00 figure, the trip was considered as starting at the beginning of a twenty-four-hour working day in order to allow the maximum number of working hours in any one twenty-four-hour period. The trip day was, therefore, started at midnight and, for trip-rate purposes, it was assumed that the driver would work the full twenty-four-hour period, less the required Interstate Commerce Commission eight-hour layover period. Under these conditions the driver then would work sixteen hours in the twenty-four-hour period of which eight were straight time, eight were overtime and eight were the required layover. Thus, the round-trip running time, not including the eight hours layover, was estimated at seventeen hours(ten hours to Nellis and seven hours return) and the trip rate was then calculated as follows:

(Continued on page 126)

EATON
2-SPEED AXLES
keep Trucks on the Job-Reduce Maintenance Costs



By providing a gear ratio best suited for each road and load condition, Eaton 2-Speed Axles permit engines to work in their most efficient and economical speed range, reducing stress and wear on operating truck parts. Truck maintenance is reduced, trucks deliver more on-the-job hours. In addition, because of Eaton's exclusive planetary design, forced feed lubrication, and extra rugged construction, there's less maintenance on the axle itself. When axle repair is required, Eaton's down-to-earth design makes the work quick, easy, and economical. Trucks with Eaton 2-Speed Axles last longer, earn more at lower cost, are worth more on the trade-in.

Ask your Truck Dealer for Complete Information.

More than Two Million Eaton Axles in Trucks Today!

EATON AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

EATON® PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

PEOPLE

IN THE NEWS

Production Engineer

H. F. SWANEY has been appointed production engineer in the operations department of United States Gypsum Co., Chicago, Ill. He replaces C. F. Gloeckner, who succeeds him as board superintendent at the Oakfield, N. Y., plant. A graduate of the University of California, Berkeley, Calif., Mr. Swaney joined U. S. Gypsum in 1946 in Jacksonville, Fla. He was appointed assistant plant engineer of the New Brighton, N. Y., plant in 1948 and one year later was named plant engineer of the Jacksonville plant. In 1950 he was appointed plant engineering superintendent and subsequently became board superintendent. He was transferred to the Oakfield plant in 1953 as board superintendent.

Speight Joins A.S.T.M.

FRANK Y. SPEIGHT has been appointed assistant technical secretary of the American Society for Testing Materials, Philadelphia, Penn. For the past eight years he has been assistant to the executive director of the National Academy of Sciences, National Research Council, Advisory Board on Quartermaster Research and Development.

Assists Chief Engineer

HARRY A. REICHENBACH has been appointed assistant chief engineer at the Alpena, Mich., plant of Huron Portland Cement Co., Detroit, Mich. A graduate of Lehigh University, Bethlehem, Penn., Mr. Reichenbach was formerly with the basic industries division of Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

U.M.A. Officers

HARRY B. ROBERTS, sales manager of the Salt Lake City, Utah, office of Ideal Cement Co., Denver, Colo., has been elected first vice-president of the Utah Manufacturers Association, and J. Eastman Hatch, president, Utah Sand and Gravel Products Corp., Salt Lake City, Utah, has been elected treasurer.

On Sales Staff

FRED H. GADES has been appointed sales manager of United Cement Products Co., Wichita, Kan. He was formerly assistant to the vice-president of sales of the Pittsburgh & Midway Coal Mining Co. He has a B.S. degree in engineering and is a veteran of World War II. Keith Lesher, a graduate of Wichita University, Wichita, Kan., joined the sales staff following his release from the air force in Korea.

Mercer Lime Officers

J. GLENN HAWTHORNE was recently appointed executive vice-president and general manager of the Mercer Lime and Stone Co., Branchton, Penn., in addition to his duties as secretary-treasurer. He is also a director of the company. In January, 1954, Mr. Hawthorne purchased the interests of Harry Peterson in the Mercer Lime and Stone Co. and replaced Mr. Peterson in the management of the firm. At that time he was appointed secretary-treasurer and a member of the board of directors. In September, he was promoted to executive vice-president and general manager. Dean D. Thompson is president of the company and C. Ray Hutchinson is vice-president, assistant secretary-treasurer and plant manager.

Advertising Manager

ROBERT M. HEATON has been appointed advertising manager of Cedar Rapids Block Co., Cedar Rapids, Iowa, and its affiliate, Dur-O-Wal Products, Inc. A graduate of advertising and commerce from the University of Iowa, Ames, Iowa, Mr. Heaton was formerly assistant to the advertising manager for Collins Radio Co.

Robert M. Heaton

District Engineer

MALCOM S. LORING has been appointed district engineer of the Boston, Mass., office of the Portland Cement Association, Chicago, Ill. He succeeds F. E. Votaw, who has retired after 20 years of service with the Association. A graduate of the University of Maine, Orono, Me., Mr. Loring joined the P.C.A. in 1947 as a field engineer with the Philadelphia district office. He has since served in that capacity with the New York and Boston district offices. As district engineer in Boston, he will direct Association activities in Massachusetts, Maine, Vermont, New Hampshire and Rhode Island under the direction of M. J. McMillan, eastern regional manager.

Mr. Votaw joined the P.C.A. in 1935 as a field engineer, was appointed chief field engineer in the Boston area in 1941 and district engineer in 1946.

Huron Appointments

FRANCIS H. COLLINS has been appointed superintendent of the Duluth distributing plant of Huron Portland Cement Co., Detroit, Mich., in addition to being in charge of milling and distributing operations at the Superior plant. He succeeds Carl Christianson, who has retired. Richard G. Burr has been named assistant superintendent at both Duluth and Superior plants. He was formerly a clerk at the Saginaw plant.

Named Managers

O. H. Hammerstrom has been appointed sales promotion manager for concrete masonry products of Cleveland Builders Supply Co., Cleveland, Ohio, and Howard J. Williams has been named to succeed Mr. Hammerstrom as manager of the brick department, where he has been serving as assistant manager.

Technical Director

PAUL F. RICE has been appointed technical director of the American Concrete Institute, Detroit, Mich. A civil engineering graduate of North Dakota State College, Mr. Rice received his M.S. degree in civil engineering at the Massachusetts Institute of Technology, Cambridge, Mass., and the University of Michigan, Ann Arbor, Mich.

80 Years Young!

SEWELL AVERY, chairman of the board of the United States Gypsum Co., Chicago, Ill., who recently celebrated his 80th birthday, has been associated with the gypsum industry for 60 years. He was born in Saginaw, Mich., on November 4, 1873. After obtaining a law degree from the University of Michigan, Ann Arbor, Mich., he became secretary of a small gypsum plant at Alabaster, Mich., in 1894. A few years later when several small firms merged to form United States Gypsum Co., Mr. Avery became Eastern sales manager. He was elected president in 1903, when he was 32, and has never been anything but a president or chairman since. He is also chairman of the board of Montgomery Ward & Co., Chicago, Ill. Mr. Avery still enjoys his favorite game of golf and can still break 100, according to friends who have played with him. He also likes trap shooting.

Universal Sales Managers

HARRY E. BERGOLD has been appointed sales manager of the Albany, N. Y., territory of Universal Atlas Cement Co., New York, N. Y., and W. Troy Gaunt has been named sales manager at St. Louis, Mo. John J. Crowley has been promoted to assistant sales manager at Pittsburgh, Penn., and James A. Hunter has been made assistant sales manager at Minneapolis, Minn.

Mr. Bergold, a native of Wilkes Barre, Penn., attended Cornell University and later served as engineer with the State Highway Departments of New York and Pennsylvania. He joined Universal Atlas in 1941 as a salesman and in 1946 was appointed district sales manager at Albany.

Mr. Gaunt, a native of Slater, Mo., has been active for the past 30 years in sales work in the Kansas City and St. Louis areas, where he has been assistant sales manager and later district sales manager.

Mr. Crowley, a native of Pittsburgh, Penn., joined the Pittsburgh office in 1945 upon his discharge from the U. S. Army. In 1948, he was appointed salesman in northwestern Pennsylvania, and six years later was assigned to metropolitan Pittsburgh.

Mr. Hunter was born in Kansas City, Mo., where he joined the sales office in 1938. Upon his discharge from the U. S. Army in 1945, he rejoined the company as salesman in the Des Moines office. In 1947, he was transferred to the Minneapolis office as chief clerk.

Slag Conference Delegate

FRED HUBBARD, director of research, National Slag Association, Washington, D.C., was selected to represent

Fred Hubbard

the United States' slag industry at the recent International Conference on Utilization of Blast Furnace Slag, held in Brussels, Belgium. Mr. Hubbard, who has been associated with the slag industry for many years and is recognized as an outstanding authority on the utilization of blast furnace slag as a mineral aggregate, presented a paper on the "Production and Utilization of Iron Blast Furnace Slag in the United States of America."

Reichenbach Joins Dewey

J. H. REICHENBACH has been appointed chief chemist of Dewey Portland Cement Co., Allentown, Penn. He was formerly chief chemist of Coplay Cement Manufacturing Co., Coplay, Penn. Prior to that he was research chemist at the Flintkote Co., Morristown, N. J., where he worked on asbestos cement research. During the war, Mr. Reichenbach was connected with the division of war research at Columbia University. He received his first experience in cement research at the Nazareth Cement Co., Nazareth, Penn., as a chemist and research engineer. He holds a degree in chemistry from the University of Pennsylvania, Philadelphia, Penn.

Dr. Bouge Retires

DR. ROBERT H. BOGUE, international authority on portland cement and organizer of the research program of the Portland Cement Association Fellowship at the National Bureau of Standards, has retired after 30 years of service. Born in Southborough, Mass., Dr. Bogue received his B.S. degree in chemistry from Tufts College, Medford, Mass., and his M.S. degree from Massachusetts Agricultural College — now the University of Massachusetts, Amherst, Mass. After serving two years on the faculty of the Montana State College, Bozeman, Mont., Dr. Bogue accepted appointment as a Fellow at the Mellon Institute of Industrial Research, where he remained five years, and then served two years on the faculty of Lafayette College, East-

Harry E. Bergold

W. Troy Gaunt

James A. Hunter

John J. Crowley

on, Penn. Dr. Bogue is author of "The Chemistry of Portland Cement," "The Chemistry and Technology of Gelatin and Glue" and "The Theory and Application of Colloidal Behavior." The Portland Cement Association has sponsored the Fellowship at the National Bureau of Standards since 1924, and has carried on a program of research which has enabled the cement industry to operate along sound chemical principles.

N.C.M.A. President

S. CARL SMITHWICK, newly elected president of the National Concrete Masonry Association, is an example of what ability tied in with the free enterprise system can accomplish in a few short years, for Mr. Smithwick

S. Carl Smithwick

built his first concrete masonry plant in the suburbs of Portland, Ore., only eight years ago.

The new president of N.C.M.A. was born in Guthrie, Okla. His parents moved to Spokane, Wash., where he received his grade and high school training. He graduated from the University of Washington, Seattle, Wash., as a civil engineer. His first job was with the city engineering department of Seattle where he remained until 1932. That year he joined the Portland Cement Association as district engineer for Spokane and covered eastern Washington and the state of Idaho.

While with the P.C.A., Mr. Smithwick took a keen interest in the concrete products plants in his territory. These contacts crystallized into a desire to become a part of the concrete masonry industry. In 1946 he founded the company that bears his name — Smithwick Concrete Products. In 1948 he built another plant at Eugene, Ore. The two plants are of similar capacity and were described in the October, 1950, and January, 1952, issues of ROCK PRODUCTS. Late in 1949, Mr. Smithwick, sensing the importance of an artificial lightweight aggregate, started construction in Portland of an expanded shale plant, which went into production in 1950. He has been a director of N.C.M.A. for five years. He was the first president of the newly formed Expanded Shale Institute, and is now a director of the Institute.

President Honored

THE GREAT LAKES freighter George F. Rand of the American Steamship Co., Buffalo, N. Y., has been renamed Ben W. Calvin in honor of the president of the Aetna Portland Cement Co., Bay City, Mich.

Secretary-Treasurer

JOHN POTTER has been reappointed secretary-treasurer of the State Cement Plant at Rapid City, S. D., for a four-year term, according to an announcement by Gov. Sigurd Anderson of South Dakota.

OBITUARIES

MEREDITH R. L. BOVEE, general operating consultant of The General Crushed Stone Co., Easton, Penn., died suddenly on November 30. He was 58 years of age. Born in Hepburnville, Lycoming County, Penn., Mr. Bovee became associated with The General Crushed Stone Co. in 1930 at the time it acquired the Rock Cut Stone Co., Syracuse, N. Y., where he had been superintendent since 1928. He retained this position after the merger and, in 1932, was transferred to the Leroy, N. Y., plant of General Crushed Stone Co. Four years later he was appointed general superintendent at Easton, Penn. He returned to Syracuse as general superintendent in 1939, and in 1944 went to Easton as general superintendent. In May of 1954, he was appointed general operating consultant.

JOHN NAGY, SR., founder of Columbia Concrete Products, Inc., Toledo, Ohio, died December 26 after a 10-day illness. Born in Hungary, Mr. Nagy had lived in Toledo 68 years. He retired 15 years ago from the business which he founded in 1891.

CHARLES F. PLATZ, vice-president of sales, Michigan limestone division, Rogers City, Mich., of the U. S. Steel Corp., New York, N. Y., died December 24 at the age of 59. Born in Rogers City, Mr. Platz joined the U. S. Steel Corp. as a quarry laborer. He became secretary to the president of the then Michigan Limestone and Chemical Co. in 1913 and was named vice-president of sales in 1949.

RAY H. VOGTLI, owner and operator of Ray Vogtli & Son, sand and gravel firm in Gowanda, N. Y., died December 28. He was a member of the Empire State Sand, Gravel and Ready Mix Association.

LOUIS L. HOLM, branch manager of the North Milwaukee Lime and Cement Co., Milwaukee, Wis., died suddenly on December 1. He was 65 years of age and had been associated with the firm for 43 years. He had been branch manager for the past 28 years.

FRANCIS WESTON, retired general manager of the phosphate division of the Cummer Lumber Co., Jacksonville, Fla., died November 21 at his home in Newberry, Fla., following a short illness. He was 85 years old. Mr. Weston was one of the few remaining hard rock phosphate pioneers and had gone to Florida in 1891 to engage in the phosphate business. He moved to Newberry in 1906.

RICHARD K. THORSELL, operator of the Thorsell Sand and Gravel Co., Stockbridge, Mass., died suddenly on December 6 at the age of 56.

JULIUS MASIELLO, president and co-founder of the Goodstone Manufacturing Co., Rochester, N. Y., precast concrete products producers, died December 17. A native of Italy, Mr. Masiello came to the United States in 1906.

ALFRED R. BRODINE, a sales engineer with the Huron Portland Cement Co., Detroit, Mich., for 20 years, died December 9 at the age of 58.

WILLIAM F. MILLER, general manager of the Lorain Slag Co., Lorain, Ohio, was killed November 30 while trying to rescue an employe trapped on a collapsing slag pile. He was 35 years old.

EARL C. HUEBNER, treasurer and traffic manager of the Marblehead Lime Co., Chicago, Ill., died November 19. He was 64 years old and had been associated with the firm for 33 years.

BRENTS THURMOND, owner and manager of the Russellville Concrete Products Co., Russellville, Ky., died December 27 at the age of 63.

CHARLES A. ERNSTBERGER, SR., New York district sales manager for the Keystone Portland Cement Co., Philadelphia, Penn., died December 17 after a year's illness. He was 68 years old.

INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S COVER is an illustration of the new gypsum quarry of National Gypsum Co., near Halifax, Nova Scotia. At the time the photograph was taken the excavation had reached the quarry floor, 80 ft. below the ground surface. The primary crusher will be located in the quarry floor with the product going by belt conveyor to a secondary crusher on the surface. Another belt conveyor will take the secondary crusher throughs to a 10,000 ton surge stockpile from which material will be reclaimed by a belt conveyor to a car loader. The gypsum deposit at the quarry site is 300 ft. deep. It lies beneath 8 to 40 ft. of overburden.

Glass Sand Plant

BRENTWOOD SILICA SAND CO. has announced plans for a glass sand quarry and plant costing approximately $1,000,000, to be built on a 340-acre tract south of Brentwood, Calif. The County Planning Commission has asked for assurances that the company confine its blasting to between 7 a.m. and 6 p.m. daily, and that the firm be required to take adequate dust control measures. The sand firm also plans to reactivate quarries near Livermore and Byron, Calif.

To Add Third Cement Kiln

MISSOURI PORTLAND CEMENT CO., St. Louis, Mo., recently announced that it has purchased a third kiln for its cement plant at Prospect Hill, Mo. The plant was originally designed for three kilns, with two being placed in operation in 1950. The third has been purchased and will be erected in 1955-1956. When this installation is completed, including companion mills, plant capacity will be 4,800,000 bbl. of cement annually.

Sand and Gravel Plant

SOUTHERN MATERIALS CO. of Norfolk and Richmond, Va., is building a sand and gravel plant, at a cost of approximately $100,000, near James River in Chesterfield County. Crushing, screening, storage and loading equipment is being installed, with shipping to be handled by barge, railroad and truck.

Cement Plant Proposed

THE UNITED STATES CEMENT CORP., has announced the proposed establishment of a cement plant near Perris, Calif., instead of Hemet, Calif., as previously planned. The corporation amended its application for a permit to build the plant, following opposition by Hemet citizens, and due to the Perris site's proximate location to railroads and utilities. Plans call for limestone to be "piped" from deposits in the San Jacinto Mountains nearby.

Sand and Gravel Plant

PUTNAM-HAWLEY BUILDING MATERIALS, INC., Potsdam, N. Y., is building a new sand and gravel washing and crushing plant at West Parishville, N. Y. The new plant, which will replace present facilities, will have a capacity of 1000 to 1500 tons per day, and will go into operation next spring. Two sizes of sand and three of gravel will be produced.

Potash Development

KERR-MCGEE OIL INDUSTRIES, INC., Oklahoma City, Okla., has entered into an agreement with the National Farmers Union for development of potash deposits in Southeastern New Mexico. The two firms have announced plans for the formation of a jointly-owned corporation to mine, process and distribute the potash on a nation-wide basis. Farmers Union holds leases on 13,000 acres of land in Eddy and Lea Counties, with an estimated value of over $100,000,000. Kerr-McGee is starting a pilot operation on property near Artesia, N. M., as the first phase of the development program.

Cement Firm Repays Loan

GIANT PORTLAND CEMENT CO., Philadelphia, Penn., has paid off its bank debt in full and "is for the first time in years free of bank loans or mortgage debt," as recently announced by R. M. Craigmyle, chairman of the board. The company's South Carolina and Pennsylvania plants are both in full operation and, as stated by Mr. Craigmyle, "the demand for our product is strong throughout our trade territories."

Aggregate is loaded out at yards of Lambert Brothers, Inc., Knoxville, Tenn., by an International TD-14A crawler tractor with Drott Skidshovel. This unit reportedly loads out over 50 percent of the 200,000 cu. yd. of material produced annually at the Knoxville plant, one of 17 operated by the company

Acquires Maule Control

FERRE INDUSTRIES, of Puerto Rico, has acquired the controlling interest in Maule Industries, Inc., with the purchase of 700,000 shares of common stock from Chemical Research Corp. The firm had previously purchased 200,000 shares with the option of acquiring control of the company. Among Ferre holdings are a glass factory, paper mill, two cement companies, a steamship company, a dry dock and a foundry in Puerto Rico. The firm has acquired the unique reputation of never selling a property, and has developed into one of Puerto Rico's largest industrial organizations. J. H. Buchanan, president of Maule, reports that the acquisition by the Ferre interests will result in further strengthening of Maule's position and expansion of its facilities in South Florida. The Ferre firm was founded by Antonio Ferre, who now acts as adviser to his four sons, each of whom owns one-fourth interest in the company. Joe Ferre is the new chairman of the Maule board of directors, and Luis Ferre has been added to the board. J. H. Buchanan will continue as president and M. F. Pafford as executive vice-president and treasurer. The change of ownership will not affect the policies of the company, nor its organization of personnel.

Lehigh Expansion

LEHIGH PORTLAND CEMENT CO. has announced plans for a $15,000,000 expansion program at its Union Bridge, Md., plant. The plant is expected to produce more than 3,000,000 bbl. of cement annually, when the expansion is completed late in 1956. This is the seventh major project in the company's post-war expansion program, which has resulted in an increase of 7,200,000 bbl. since the close of World War II. Since 1948, capacity has been increased at plants in Metaline Falls, Wash., Fordwick, Va., Mason City, Iowa, and Alsen, N. Y. Production at the Bunnell, Fla., plant, built in 1952, is presently being doubled. After modernization at the Union Bridge, Md., plant, the company's cement output is expected to total 26,500,000 bbl. annually.

Buys Crushed Stone Firm

BUFFALO CRUSHED STONE CORP., Buffalo, N. Y., has been purchased by Frontier Industries, Inc., through an exchange of Frontier Industries' stock for Buffalo Crushed Stone stock held by James Savage, and Frederick W. Schmidt and his family. The crushed stone company has been in operation since 1904, producing bituminous paving materials and operating a stone quarry near Bowmansville, N. Y. James Savage, one of the founders, has been elected chairman, succeeding Otho M. Graves, deceased. Frederick W. Schmidt continues as president of Buffalo Crushed Stone, which is being operated as a wholly-owned subsidiary of Frontier. George F. Phillips, is secretary, and Robert L. Wilson is treasurer. Ralph F. Peo, president of Frontier, is a director of the newly acquired company, and William Cavanaugh is continuing as vice-president.

Buys Aluminum Plant

IDEAL CEMENT CO. of Denver Colo., purchased the federal government's experimental alumina plant at Laramie, Wyo., for $1,200,000. The plant machinery has been adapted to lightweight aggregate production, and will serve Utah, Wyoming, Colorado, Nebraska and possibly Minneapolis and St. Paul, Minn., according to Cris Dobbins, president.

Open Limestone Quarry

NORTHWESTERN PORTLAND CEMENT CO., Seattle, Wash., has started operations at a new limestone quarry above Lake Wenatchee at Soda Springs, Wash., with a daily production of approximately 1000 tons daily. Facilities include a primary crusher, an impactor for secondary crushing, several conveyor systems, and a stockpile and bunkers for truck loading. The limestone is trucked to a Great Northern Railway siding, from which point it is shipped by rail to the company's cement plant at Grotto, Wash. Diamond drill tests have indicated a supply of limestone sufficient to meet the cement plant requirements for over 50 years. James Halloran is quarry superintendent.

Celebrates 50th Anniversary

BUFFALO CRUSHED STONE CORP., Buffalo, N. Y. celebrated its "Golden Anniversary" in 1954. Comparatively few companies in the crushed stone business can trace their history back 50 years. James Savage, secretary-treasurer, has been with the company since it first started operations in 1904. He has been treasurer and a director of the National Crushed Stone Association for many years.

Perlite Processing Plant

WESTERN MINERAL PRODUCTS CO. has opened a perlite processing plant in Minneapolis, Minn., adjoining its vermiculite expanding operations. The plant has 9000 sq. ft. of floor area, materials handling facilities, and a larger furnace, which is expected to increase production of perlite products by about 50 percent. Consolidating its perlite and vermiculite operations will enable the firm to speed its service by loading the two materials into the same car or truck.

Cement Plant Started

CALIFORNIA PORTLAND CEMENT CO., Los Angeles, Calif., has started construction of its $12,500,000 cement plant near Mojave, Calif. The new plant, which is expected to be in operation by August, 1955, will have a capacity of 2,000,000 bbl. of cement annually. A 9½-mile railroad spur is being constructed to the plant site by the Southern Pacific Co.

To Expand Gypsum Plant

NATIONAL GYPSUM CO., Buffalo, N. Y., has started an expansion of its Baltimore, Md., plant, designed to increase capacity by about one-third. Cost of the expansion was estimated at $500,000. The addition to the Baltimore plant is a part of National Gypsum's $15,000,000 over-all expansion program planned for the next 18 months.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 25,887,000 bbl. of finished cement in October, 1954, as reported by the Bureau of Mines. This was an increase of 5 percent over the October, 1953, figure. Mill shipments totalled 27,133,000 bbl., 2 percent less than in

Lehigh Portland Cement Co.'s Union Bridge, Md., plant which will expand operation

October, 1953, while stocks were 4 percent less than those on hand for the same month of 1953. Clinker production during October, 1954, totalled 25,031,000 bbl., an increase of 5 percent from the October, 1953, figure. The output of finished cement during October, 1954, came from 157 plants located in 37 states and Puerto Rico. During the same period of 1953, 24,738,000 bbl. were produced.

Permanente Earnings

PERMANENTE CEMENT CO., Oakland, Calif., reports net earnings of $4,144,000, or $1.48 per share on 2,800,000 shares for the nine months ended October 31, 1954. This was an increase of 20 percent over net earnings for the same period in 1953, of $3,458,000, or $1.23 per share. Net sales for the nine months of 1954, were $30,773,000, 12 percent higher than the 1953 figure of $27,398,000.

25-Year Service Awards

THE CONSOLIDATED QUARRIES CORP., Decatur, Ga., recently awarded gold watches to 15 men who have been in the employ of the company for 25 years. Among those receiving awards was Nels Severinghouse, vice-president and general manager. The company operates a large crushed granite plant, established in the late 1920's, at Lithonia, Ga.

Safety Celebration

UNIVERSAL ATLAS CEMENT CO.'S Northampton, Penn., plant rededicated, for the ninth time, the safety trophy presented to the plant in 1931 by the Portland Cement Association. The trophy is rededicated following each year of safe operation. The celebration marked 1,187 days or 2,850,000 man-hours of operation without a lost-time accident.

Sand and Gravel Plant

SUPERIOR SAND AND GRAVEL CO., owned and operated by Clyde Gesaman, Canal Fulton, Ohio, has started operation of a new plant near Massillon, Ohio, on Highway 21. Production includes crushed road gravel and mason sand.

Moves Agstone Plant

RIDDLE SOILS SERVICE of Marion, Kans., has moved its agricultural limestone plant near Haddam, Kans., to the John F. Mueller farm south of Hanover, Kans. The move was made due to depletion of reserves at Haddam.

Adds Portable Crusher

MAPLETON ROCK PRODUCTION CO., Mapleton, Ore., has expanded plant operations by the addition of a portable crusher, which reportedly can be moved 20 miles, set up and placed in operation within two hours. The crusher is a 22 x 25 Cedarapids jaw, mounted on a 7-ton Federal truck.

Above: Portable jaw crusher, mounted on 7-ton truck. Below: Crusher was moved 20 miles, set up and operating in two hours time

More Cement Plant Expansion

LONE STAR CEMENT CORP., New York, N. Y., is modernizing and expanding its Bonner Springs, Kans., cement plant. Plans call for installation of a new kiln and auxiliary equipment, a ball mill for raw grinding, coal mill, clinker grinding mill, raw material feed bins, tanks and additional power distribution equipment. The new kiln will make a total of four at the plant, and is expected to increase annual production by 660,000 bbl. of cement. The $14,200,000 expansion program also includes modernization of the Nazareth, Penn., and Greencastle, Ind., plants. The Bonner Springs project is expected to be completed by late 1955.

Lime Plants Close

EAGLE ROCK LIME CO., Eagle Rock, Va., operated continuously by the McNamara family for over 50 years, closed down its lime operations on August 31, 1954. The plant was not sold, but reportedly is to be shut down permanently. Another relatively old lime plant, Atlas Lime Products Co., El Paso, Texas, closed its plant on July 31, 1954.

Buys Gravel Company

ST., PAUL SAND AND GRAVEL CO., St. Paul, Neb., formerly owned by Robert T. Paul, was purchased by H. L. Camp and Homer Hawk of Grand Island, Neb. The company will continue to operate under its present name.

Safety Record

IDEAL CEMENT CO.'S Portland, Colo., plant recently celebrated its 1000th day without a lost-time accident. According to the Colorado Industrial Commission, the plant's record of more than 1,700,000 man-hours represents the longest industrial safety record achieved in the state.

Fortieth Anniversary

STANDARD SLAG CO., Youngstown, Ohio, recently celebrated its 40th anniversary at a dinner party, where 20 employes were presented service pins, representing 25 or more years of service with the company.

Coming Conventions

February 7-9, 1955—
National Crushed Stone Association, 38th Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio.

February 14-16, 1955—
Fourth Annual Quality Concrete School, Georgia Institute of Technology, Atlanta, Ga.

February 21-24, 1955—
American Concrete Institute, 51st Annual Convention, Hotel Schroeder, Milwaukee, Wis.

February 23-24, 1955—
Iowa Agricultural Limestone Association, Inc., Tenth Annual Convention, Savery Hotel, Des Moines, Iowa

March 9-12, 1955—
American Concrete Pipe Association, 47th Annual Convention and Meeting, Sheraton-Plaza Hotel, Boston, Mass.

HINTS AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Belt conveyor gallery for stockpiling is carried on wooden pole bents

Economical Stockpiling

IN THE PACIFIC NORTHWEST where the tall trees grow, the construction of an efficient stockpiling system for finished aggregates is much simplified and construction costs are reduced to a low figure. In the illustration, the poles used for supporting the main conveyor gallery costs about $10 each. With the aid of a few handy men, a carpenter or two, and a suitable yard crane, the above-ground structures of the stockpiling system can be built very reasonably. At this operation, a reclaiming belt conveyor operates in a tunnel and loads to trucks for delivery to customers.

Radial Stacker Drive

IN THE ACCOMPANYING ILLUSTRATIONS are shown a power driven radial stacker used in a Florida operation. Large storage capacity and ample drainage time is afforded by this type of stacker.

Power is applied to the radial stacker by an enclosed-drive motor, a close-up of which is shown in one of the illustrations.

Tailing Pond Construction

STREAM POLLUTION continues as a serious problem for some operations in the disposal of tailings. A series of articles appeared in ROCK PRODUCTS on the problem and how it was being met, the most recent of which was the article in the November, 1953 issue, page 74.

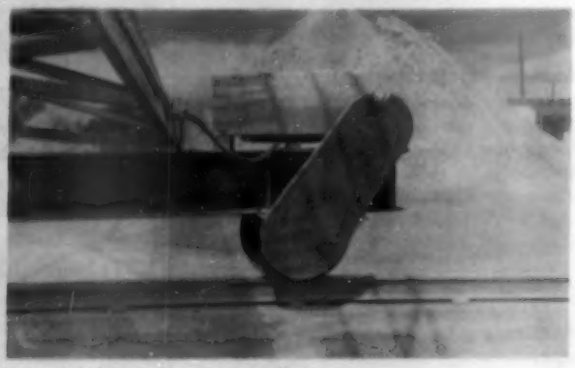
One of our readers supplied the accompanying photograph showing a retaining dike used by a mining operation in southeast Missouri which has proved efficient.

Two types of rejects are collected; a coarse product from the concentrating tables and the finer tailing from the flotation plant. An outer dike was evidently first built, using the coarse sands. The inner face of this high dike was then slime-coated with the rejects from the flotation plant to make the dike impervious to water. The dike was built up by the use of curved steel

Above: Section to tailing pipe with valve. **Below: Some of the pipe lines** are four miles long

pipe with outlets at frequent intervals. For valves on these outlets, Grigsby pinch-valves are used. These are essentially a rubber sleeve with a clamp. Their greatest advantage is that the valve does not easily wear out when handling abrasive pulps. They are made by Mine & Smelter Supply Co., Denver, Colo.

The dike is now over 60 ft. high, and at one time an outer pipe line placed the table tailings and an inner pipe line placed the finer flotation tailings. The ponds are now so extensive that a single pipe line can be used alternately for coarse and fine sand, and when conditions permit the two materials are mixed and a coating is rapidly built up. A large part of the flotation slimes enter the pond direct



Left: Radial stockpiling stacker belt. Right: Close-up of electrical motor drive for stacker

near the mill. Some of the lines are four miles long and require 175 lb. pump pressure to insure delivery of pulp to the ponds.

Distributing Chute

A PRODUCER IN THE SOUTHWEST has been using a unique chute for more even distribution of material to be fed to a screen. It will be noticed

Distributing chute to feed material to screen uniformly

that the steel chute not only distributes material to be screened, but it also serves to feed more uniformly with resultant reduced wear. The mouth of the chute flares out at the sides, and within are deflecting plates to distribute the flow.

Fire Protection

AT THE NEW KAISER GYPSUM CO. INC., plant in Seattle, Wash., safety precautions are stressed throughout. One phase of this safety first program is adequate fire protection. Oil is used for fuel, and the storage tank is surrounded by a high concrete wall that will hold back any oil or act as a barrier should there be a fire.

In foreground is concrete fire-protection wall surrounding oil tank. Arrow points to fireproof structure housing fire-fighting equipment

Arrow points to angle-board which is used to scrape off materials on conveyor

Simple Stockpiling System

A LARGE, PROGRESSIVE CONCRETE MASONRY MANUFACTURER in the South has a very simple and efficient method of stockpiling the aggregates. Expanded slag and granite screenings are the principal aggregates which are stored. The material is scraped off the inclined belt conveyor at the designated point by an angle-board scraper. Reclaiming is done with a front-end loader that delivers material to the hopper at the extreme right, foreground.

Water Injector for Pipe Line

AT A SAND AND GRAVEL PLANT on the West Coast, there was an excess amount of sand that had to be disposed of. This excess sand was for-

A 6-in. pipe salt water injector line which is used if 12-in. main line is in danger of sanding up

merly stacked by a belt conveyor system, but more recently two 12-in. Morris sand pumps (one is a spare) are called into service when the disposal problem arises. The sand is pumped about one-half mile through a 12-in. line that lays practically at a flat grade.

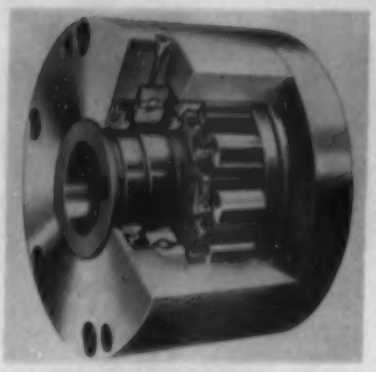
It was believed that the pipe line might sand up so provisions were made to inject sea water into the line by means of a 6 in. booster pump. It will be noted in the illustration that the booster line enters the 12-in. line at a flat angle. The booster pump has seldom been used, but it is there as an insurance against such a situation.

Removable Crusher Guard

AT A SOUTHWESTERN PLANT producing a large quantity of rip-rap, the minus 6-in. material from this operation is reduced in a 4¼ ft. Symons cone crusher. Above the cone crusher is an inclined grizzley over which material is fed to the crusher. To prevent stone particles from being thrown out and endangering workmen, a removable steel plate guard has been placed around the back of the crusher feed opening.

Cone crusher with removable guard

NEW MACHINERY



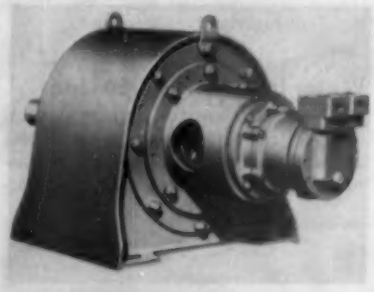
Heavy Duty Cam Clutches

MORSE CHAIN CO., 7601 Central Ave., Detroit 10, Mich., has brought out a line of extra heavy-duty, ball bearing, overrunning clutches, designated the "K" Series, for indexing, backstop and general duty machinery applications. The clutches incorporate many of the design features of the former Kelpo overrunning clutches. The Series K clutches have a toothed inner race driving member that actuates closely spaced independently sprung cams. Tapped holes are provided in both ends of the clutches for attaching sprockets, gears, pulleys or ratchet arms for drive requirements from 1300 to 6000 ft./lb. Thus, the desired direction of rotation is obtained by attaching the component to either side of the clutches. The clutches are available in four standard sizes: the K-145, K-150, K-160 and K-175, each with made-to-order bore and keyway sizes.

Classifiers

THE DORR CO., Stamford, Conn., has redesigned the standard 6-, 12- and 24-in. diameter DorrClone classifiers, by incorporating replaceable molded rubber inserts, designed to increase operating life. In the 6-in. classifier, the rubber lined conical casting has been replaced by a two-piece cylindrical casting into which five molded rubber sections are fitted. The conical classification chamber is thus formed by the interior shape of the two rubber cone section liners. Additional sections include a feed chamber liner, a vortex finder, and an apex section.

The 12-in. unit also has removable feed chamber and cone section liners of molded rubber which fit into a conical cast iron housing. The vortex finders are cast iron, completely rubber covered, and for apex openings up to 2 in. in diameter, the same molded rubber parts as used in the 6-in. unit are furnished. For larger openings, an adjustable rubber disc-type valve is supplied. In the 24-in. model, the feed and upper cone sections are of fabricated steel with vulcanized, non-removable rubber linings. All other parts are the same as in the 12-in. unit.

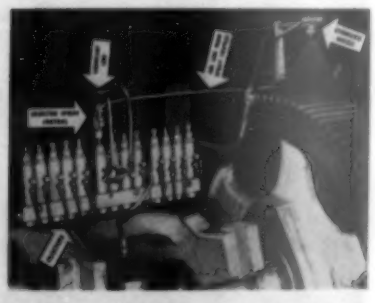


Speed Reducers

THE OILGEAR CO., 1560 W. Pierce St., Milwaukee 4, Wis., has announced the combination of its line of type "H" fluid power, constant displacement, axial piston motors with Falk's line of concentric and right angle all-steel reducers, to provide a line of integral "Oilgearducers," compact output units for Oilgear variable speed drives. The units are available with ratio combinations providing maximum output speeds from 1.7 r.p.m. to 1170 r.p.m. "Oilgearducers" with oil-tight shaft seals for vertical wall mounting and with roundface flanges for floor mounting are also available for vertical shaft applications. Units with single or double right angle output shafts are available in ratios from 5:1 to 1500:1. The above illustration shows a 20-hp. Oilgearducer with a Falk 38.41:1 reducer for speeds up to 28 r.p.m. and continuous torques up to 4000 lb./in.

Wound-Rotor Motor

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee 1, Wis., has announced a rib-type enclosed, fan-cooled wound-rotor motor with the frame extended in front to include the slip rings, brushes and brush rigging in one enclosure. The elongation also provides additional surface for heat dispersion. Removal of two large pipe plugs from the upper quadrants of the frame provides openings for maintenance work and adjustment of brushes and brush rigging. Slip-ring leads enter a separate cast-iron conduit box and the lead opening in the frame is sealed. The unit is available at 1800 r.p.m. and slower speeds, in frame sizes from 284 to 505, and in standard enclosed or explosion-proof design.



Automatic Mist Lubricator

LINCOLN ENGINEERING CO., Industrial Div., 5702-46 Natural Bridge Ave., St. Louis 20, Mo., has brought out a spray control valve which operates automatically in conjunction with centralized lubrication systems to provide controlled mist lubrication for open gears. The valve may be attached to a lubricant injector in the centralized system, mounted either adjacent to, or remote from, the gears to be lubricated. Lubrication from two or more injectors can be diverted through the lubricant line to adjustable spray nozzles, thus increasing the spray.

Tractor-Shovel

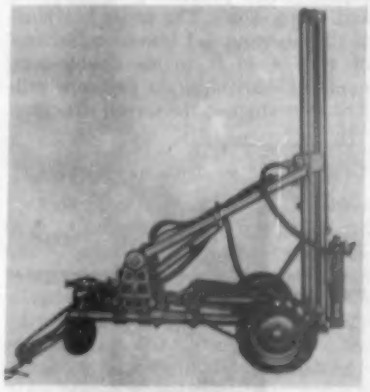
THE FRANK G. HOUGH CO., 705 Seventh St., Libertyville, Ill., has announced the "HA" model "Payloader" tractor-shovel which has a payload capacity of 18 cu. ft. and a struck-load capacity of 14 cu. ft. The bucket arm is designed to provide a 40-deg. tip-back and to permit carrying heaped loads at a lower level, thus giving better stability and operator vision. An hydraulic accumulator is incorporated to minimize load shocks and to stabilize the hydraulic controls. Other features include a torque converter drive and full-reversing transmission; a sealed and pressurized hydraulic system; double-acting rams, operating the boom-arms and bucket; solenoid starting controls; sealed grease fittings; and a dust-proof distributor.

Iron Alloy

TAYLOR-WHARTON IRON AND STEEL CO., High Bridge, N. J., has introduced Tisco 150-Y, an abrasion-resistant iron alloy which can be heat treated to 700 Brinell. Typical applications include: blades for the propulsion of blasting grit and steel shot in airless, centrifugal, blast-cleaning equipment; mixer paddles in asphalt mixing plants; etc. The alloy is claimed to last two to six times longer than conventional alloys used for the same purpose.

Heavy-Duty Motor

GENERAL ELECTRIC CO., Schenectady 5, N. Y., has announced the 500-hp., 350-r.p.m. "Giant" armored mill motor, designed and tested specially for heavy-duty work in mining applications. The motor incorporates a universal enclosure, which permits five systems of ventilation and protection by substituting different types of covers on the frame openings. Feet have been added to the frame heads for armature support, thus lessening the possibility of damage to the coils and fan when the armature is removed. Connections between halves of the motor outside the frame are designed to provide easier accessibility. An armature spider is incorporated to provide for replacement of the shaft without disturbance to the windings. The motor may be used for driving hoists and unloaders in mining operations, as well as other heavy-duty applications.



Wagon Drill

LE ROI CO., Cleveland Rock Drill Div., subsidiary of Westinghouse Air Brake Co., 12500 Berea Rd., Cleveland 11, Ohio, has added a Cleveland air motor and special axle to the DR-30 self-propelled wagon drill. Power is transmitted from the motor to the wheels by a fully-enclosed chain drive, shown exposed in the view above. The wheels are mounted on an automotive-type axle, and the patented air feed has an 8-ft. travel for 6-ft. steel changes. The air motor, with its gear ratio, provides power for propulsion over rough terrain, and a similar air motor is used for raising and lowering the wagon-drill boom.

Auxiliary Transmissions

TRUCKSTELL MANUFACTURING CO., Union Commerce Bldg., Cleveland 15, Ohio, has added two auxiliary transmissions to its line of special truck equipment. The first is a two-speed model, with an underdrive ratio of 2.18 to 1, and is engineered for trucks with a gas engine displacement of up to 265 cu. in. The other is a three-speed model with optional ratio combinations, a built-in, full engine torque, and variable speed power take-off. It has constant mesh helical-cut gears and lightweight clutch blocks, and is built for use with gas engines of up to 400-cu. in. displacement.

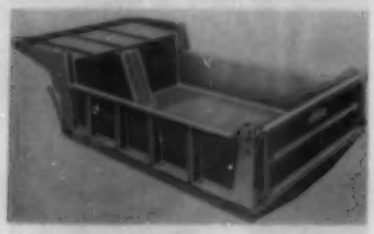
Special Tire Carcass

THE GENERAL TIRE & RUBBER CO., Akron, Ohio, is using "Nygen" for tire carcass construction in its line of off-the-road tires in sizes ranging from 12.00 x 20 to 27.00 x 33. Nygen, a specially-treated cord, is said to impart load-carrying and shock-absorbing qualities to the tires, providing resistance to impact breaks and bruises from the power of earth movers working at high speeds in rough terrain. The Nygen tires are also said to be water-resistant, making them useful for strip mining or quarry work, where water might penetrate the tire through tread cuts.

Crane-Shovel

LINK-BELT SPEEDER CORP., Cedar Rapids, Iowa, has announced the LS-68, a lightweight, ¾-cu. yd. crane shovel, replacing the former LS-52, and featuring "Speed-o-Matic power hydraulic controls. The new model features a heavy, wide lower frame, 11 ft. overall length, 9 ft. 2 in. wide with 24-in. shoes and 9 ft. 8 in. with 30-in. shoes. The track rollers are 10 in. in diameter, and of heat-treated,

forged steel, single flange construction bronze-bushed, mounted on 2½-in. diameter shafts. Separated drum gears and clutch shells permit the use of alloy cast iron clutch shells, to provide friction action and longer lining life. The clutch shells are bolted to the drum gears. The crawler-base rig is convertible to standard front end attachments, with no major changes necessary. Six conical hook rollers are standard equipment.



High Capacity Bodies

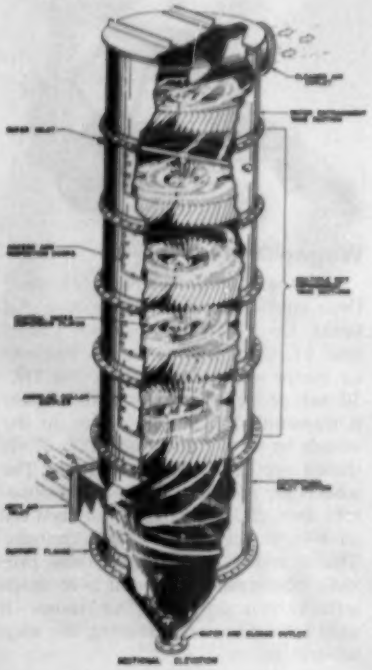
HERCULES STEEL PRODUCTS CORP., Galion, Ohio, has brought out a line of contractor's bodies including Series LD and WD rugged duty bodies, with standard lengths of 12 to 17 ft.; Series CD all-purpose bodies, with standard lengths of 10, 11 and 12 ft.; Series D standard bodies, with lengths of 8, 9 and 10 ft.; and Series PL solid steel platform bodies for 60-, 72-, 84-, and 102-in. cab to axle trucks. The models are available for use with Underbody and Telescopic hoists, and load-carrier cab shields are available on Series LD, WD and CD. The above illustration shows Model CD-20 contractor's body.

Industrial Engine

WILLYS MOTORS, INC., Industrial Engine Dept., Toledo, Ohio, recently introduced a four-cylinder "F" head industrial engine, of combination valve-in-head and valve-in-block construction. The bore and stroke of the engine is 3⅛ x 4⅜ in., and the total piston displacement is 134.2 cu. in. Maximum brake horsepower at 2400 r.p.m. is 51 hp. and at 4000 r.p.m. is 70 hp. At the same speeds, maximum torque is correspondingly 111 and 91 ft./lb. Exhaust valve rotators and full-hard-chrome top compression rings are incorporated for longer life and low oil consumption. Other features include lightweight, tin coated, aluminum alloy pistons, and automatic crank case ventilation.

Large Vibrating Screen

HEWITT - ROBINS, INC., Stamford, Conn., has introduced the Eliptex E-13 vibrating screen, which is said to have an additional 48 sq. ft. of screening surface per deck over the previous maximum. It features the live-action, three-way vibration built into smaller models, to assure high capacity, fast processing of material, and sharp sizing. The series has horizontal vibrating and dewatering screens up to 6 x 24 ft. in the double-deck model. Electrical strain gaging is utilized to strengthen the screen structure.

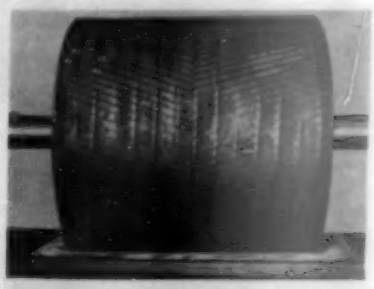


Wet Dust Collector

PANGBORN CORP., Hagerstown, Md., has announced the Type "CW-1," centrifugal wet dust collector for conditions of high temperature or moisture; explosive or combustible dusts; or corrosive, highly abrasive and/or obnoxious dusts. It consists of multiple wet vane sections and a final water entrainment vane section. The diameter of the collector varies in proportion to the air volume handled and the number of wet vane sections is governed by application requirements. The illustration shows four wet vane sections, followed by a single water entrainment section. The water supply enters above the top wet vane section and flows downward or counter to the upward flowing air, which enters the collector through the lower tangential inlet. The patented vane design is said to provide increased impingement surface and impart vigorous centrifugal action to both the air and water to provide thorough intermixing. Water and dust are discharged as sludge from the lower cone and the clean air from the air outlet at the top. After clarification in settling tanks, the water may be recirculated since no spray nozzles are used, the water inlet being an open end pipe.

Mobile Drilling Unit

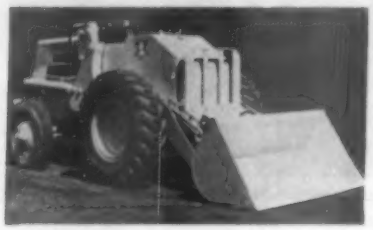
GARDNER-DENVER CO., Quincy, Ill., has brought out a self-contained mobile drilling unit, consisting of rock drills on long feed mountings, hydraulic booms, and an air compressor for powering the drills, all mounted on a Caterpillar D-8 tractor. The compressor assemblies are available in capacities of 600, 500, 365 and 315 c.f.m. for direct connection to the rear power take-off of D-8 tractors. Remote controls are also available, permitting the drilling and positioning operations to be controlled from a central station on the tractor for one-man operation.



Steel Conveyor Pulleys

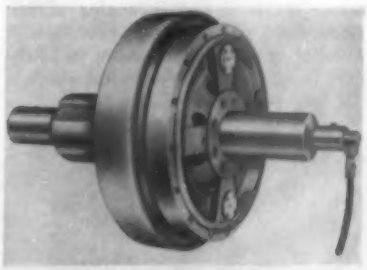
THE AMERICAN PULLEY CO., 4200 Wissahickon Ave., Philadelphia 29, Penn., has announced a line of Type "HD" steel conveyor pulleys with interchangeable "Wedg-Tite" split tapered hubs. The hub, when drawn into the pulley end-disc, squeezes the shaft with a clamp-grip. This feature

is designed to eliminate the possibility of pulleys "walking" on the shaft; and by locking the hub to the end-disc, forms a single unit for the life of the equipment. The pulleys are available with a corrosion-resistant coating, and can also be furnished complete with American Griplex Spiralagging. The line can be had as standard in either crown or straight face, in sizes ranging from 6- through 60-in. dia., from 12- through 63-in. face, and for shaft sizes through 10-in. dia. Larger sizes can be built to order.



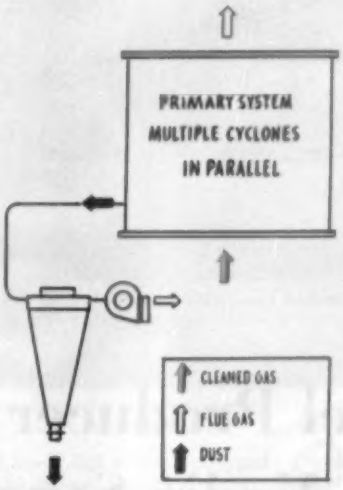
Loader

CONTRACTORS MACHINERY CO., INC., Batavia, N. Y., has brought out a ¾-cu. yd. struck capacity loader, known as the Model LH-75 Trojan Loadster. The unit has no clutches, and drives directly from the engine through a torque converter coupling to the transmission. A simple gear-type reversing mechanism provides a five-gear range for either forward or reverse travel. The directional shifting lever is located just below the steering wheel. The model loads over the drive wheels and the load weight is used to provide extra traction.



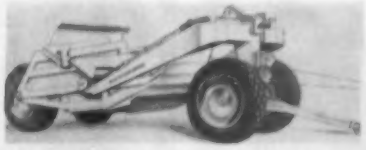
Air Clutch

DODGE MANUFACTURING CORP., Mishawaka, Ind., has announced the "Air-Grip" air clutch, which is said to respond immediately to a touch of the throttle because a minimum of air is used in the operation of the clutch. Quick release valves built into the clutch are optional for extra fast disengagement. Provision is made for internal ventilation, and the flexible air seal disc is located so that it does not come in contact with the heat generating plates, to provide cooler operation and longer life. It also features provision for mechanical engagement of the clutch in the event that the air supply fails. The clutch is available in single and double plate models from 8.5 to 806 hp. per 100 r.p.m. to 80 p.s.i.



Dust Collector

AERODYNE CORP., 1520 Lakeside Ave., Cleveland, Ohio, has developed the "Paraclone" mechanical dust collector, featuring a system by which a large number of small cyclones in parallel are used with a secondary circuit which keeps the discharge from the small cyclones under constant negative pressure. This is said to prevent recycling of dust in the primary system, and provide collection efficiency for dust particles in the range from 0 to 15 microns. The unit is adaptable to high- and low-temperature gases, containing small and large abrasive or non-abrasive particles. In installations where the bins for unloading into trucks have to be located at some distance from the primary system, the secondary system also takes the place of a conveying system. The system can be used alone or in combination with electronic precipitation.



Four-Wheel Scraper

ALLIS-CHALMERS MANUFACTURING CO., Tractor Div., Milwaukee 1, Wis., has added a rubber-tired, four-wheel scraper to its line of pull-type scrapers, which has a 15-cu. yd. struck and a 19-cu. yd. heaped capacity. Designated Model 315, it is cable-controlled and features positive forced ejection. The carbon steel, heat-treated, offset type cutting edge has a 9-ft. 8-in. cut. Overall length is 33 ft. 5 in. and width is 11 ft. 6¾ in. The overall height is 8 ft. 8 in. with the blade on the ground, and 9 ft. 2 in. when the bowl is raised. Rear bowl ground clearance is 20½ in., and front axle clearance, 29 in. when 21.00 x 24 tires are used with the haulage unit.

Electrode

PACIFIC WELDING ALLOYS CO., 310 North Avenue 21, Los Angeles 31, Calif., has announced an all-purpose, all-position line of welding electrodes, designated "All-Weld." The electrodes are designed for welding mild steels, low alloy steels, high tensile, high or medium carbon steels, cast and malleable iron, etc., as well as for cutting or punching holes. Current ranges from 20 to 250 amps are available. The electrode uses a-c or d-c, reverse or straight polarity, and is said to have smooth, free-flowing characteristics.

Pull Scraper

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis., has announced the Model 108 medium-sized, rubber-tired pull scraper, with an 8.4-cu. yd. struck and 11-cu. yd. heaped capacity. The scraper is cable operated, and of welded box-type construction. It features a three-piece reversible type cutting edge; free floating type front apron; a low and wide bowl with a curved bottom and smooth interior. Overall length is 27⅓ ft., overall width is 10⅓ ft., and in load-carrying position, it is 7⅔ ft. high.

Gasoline Engine

HERCULES MOTORS CORP., Canton 2, Ohio, has announced the use of the six-cylinder Model JXLD gasoline engine for powering the Hough TM "Payloader" tractor. The engine also operates the electrical system, and a large capacity air compressor. It has a 4-in. bore and 4½-in. stroke, providing a piston displacement of 339 cu. in. It develops 272 lb./ft. torque at 1400 r.p.m. and produces a top rated horsepower of 131 at 3200 r.p.m.

View of plant showing reject or "float" product belt conveyor and truck bin, to the left, and to the right, the scalping and washing screen with short pipe line disposing of wash water and small amount of fines

Another Gravel Producer Installs Heavy Media Separation

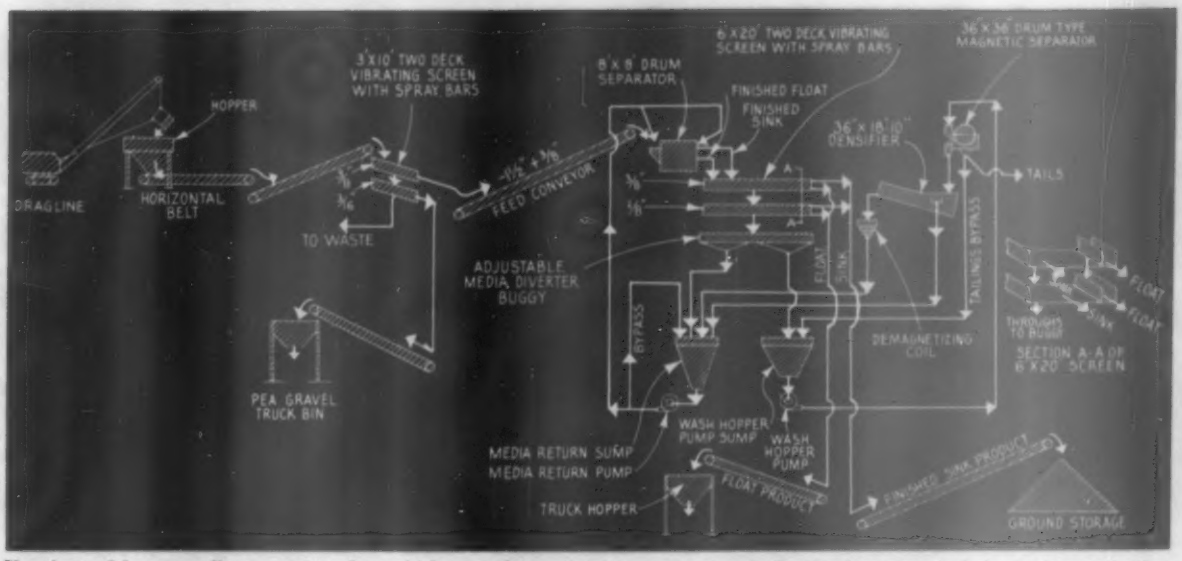
• Harry Pickitt Sand and Gravel Plant, near Northville, Mich., removes objectionable chert and shale to meet Michigan State Highway Department and Wayne County paving material specifications. Use portable screening and crushing units

By RALPH S. TORGERSON

PRODUCERS OF SAND AND GRAVEL in southern Michigan are confronted with the problem of finding readily accessible materials near centers of demand which will meet specifications for concrete paving and construction. The cost of shipping materials any great distance would be prohibitive.

Harry Pickitt, widely known highway contractor who produces aggregates for his own operations, with headquarters in Allegan, Mich., has solved the problem by the installation of a heavy media separation unit to up-grade materials at a plant which he and his partner, Ammon Schreur, operate just west of Northville, Mich., in Wayne County about 25 miles from Detroit. This plant is unique in that it has been adapted for operation with portable crushing, screening and washing units. Mr. Pickitt and his partner operate five Pioneer sand and gravel crushing and screening plants, three Pioneer washing plants, and three Diamond crushing and screening plants. These units of equipment operate at a number of different locations in Michigan in addition to Northville which is the largest operation.

Left: Close-up of 6- x 20-ft. screen following drum separator. Note board running length of screen to separate "sink" from "float" materials. **Right: Drum type magnetic separator** which removes heavy media from wash water



Flowsheet of heavy media separation plant which upgrades material to meet any specification by removal of chert, slate and other deleterious rejects

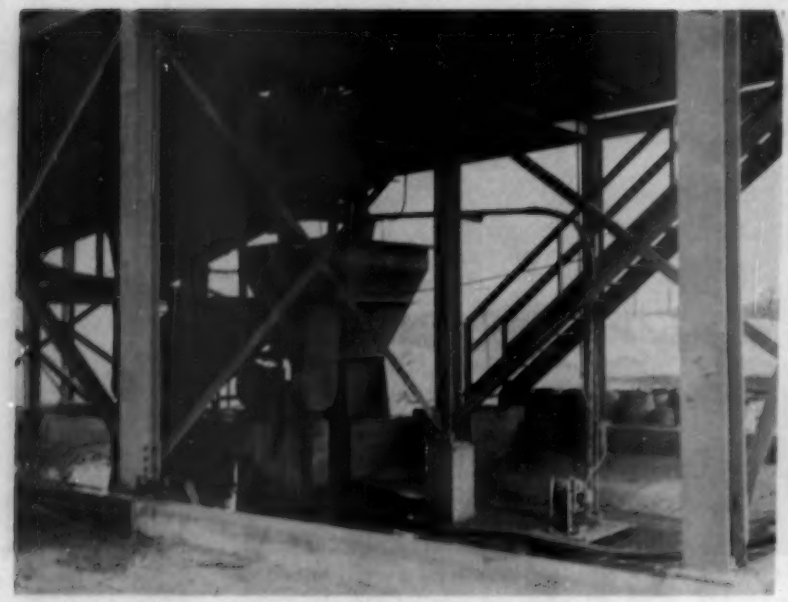
Other heavy media separation sand and gravel plants described in ROCK PRODUCTS include a dredge operation by Dravo Corporation, Pittsburgh, Penn., in April, 1953, and the permanent plant installation of Owatonna Aggregate Corp., Owatonna, Minn., in July, 1953.

The sand and gravel deposits of southern Michigan are of comparatively recent glacial origin and include along with the sound materials from 10 to 14 percent of shale, chert, mud balls and the occasional presence of "chocolate drops." The deleterious materials in the Northville deposit comprise about two-thirds shale and one-third chert with very little mud balls or chocolate drops. Overburden at Northville runs roughly about 6 in. of black dirt which is stripped off with a ¾-cu. yd. No. 25 Northwest shovel. The deposit is 45 ft. above water at the highest point, and is from 6 to 18 ft. below water. The first 4 to 8 ft. is removed and used as road gravel without any processing. Remaining material is screened, crushed and washed. Material excavated below water is of excellent quality and contains a considerable quantity of 3-in. or larger gravel which is somewhat unusual for gravel deposits in this area.

Crushing, Screening and Washing

Material from the deposit is first processed in one of the portable crushing and screening plants and stockpiled adjacent to the field hopper serving belt conveyors to the plant. At the time of inspection the material was processed dry, the portable crushing plant having a 10- x 36-in. jaw crusher and screens to produce a sand and minus 1½-in. plus ⅜-in. material. The deposit runs about 10 percent fines. Should more fines be needed to meet specifications, there is a separate deposit of 10 to 12 ft. of fines near the Northville plant which runs about 100 percent through 40 mesh. However, the material which is processed in the heavy media plant is the 1½ to ⅜-in. product of the crushing plant. A washing unit has been used in the past to give the material a thorough washing as the heavy media process is most effective when the material is free of any clinging fines or coating of particles. Any coating increases media loss.

Left: Scalping and washing screen with ⅜-in. top deck and $\frac{3}{16}$-in. bottom deck. Pea gravel on $\frac{3}{16}$-in. deck moves by belt conveyor to truck bin and throughs are piped to waste. The minus 1½-in. plus ⅜-in. on the top deck goes to an inclined belt conveyor for elevation to the drum separator in the heavy media plant. **Right: Heavy media separation plant** showing from left to right, above, the separator drum, 6- x 20-ft. screen, densifier, drum-type magnet, and stockpiling belt conveyor for "sink "product at the end. The reject or "float" product goes by belt conveyor to a truck bin. Below are the media return sump and wash water sump



Below heavy media plant may be seen media return sump in the center with wash water sump to the left. Note concrete basin to collect any media and wash water with small sump pump to return it to media return sump

The heavy media plant uses a mixture of 60 percent magnetite and 40 percent ferrosilicon for the media. Magnetite costs about $50 per ton and the ferrosilicon costs $150 per ton. The loss in media in the processing is about 1 lb. per ton of finished product or about 4.5 cents per ton.

As shown in the flowsheet, the minus 1½-in. plus ⅜-in. material to be processed through the heavy media separation plant is reclaimed from the adjacent stockpile by a ¾-cu. yd. Northwest dragline to the receiving hopper serving the belt conveyors. The first section of 24-in. belt conveyor rests horizontally at ground level and transfers its load to the second section which inclines up to a 3- x 10-ft. Pioneer two-deck vibrating screen over which are four spray bars. The two Barber-Greene conveyors are 90 ft. long, and are driven by gasoline engines.

The 3- x 10-ft. screen, driven by electric motor, has a ⅜-in. mesh top deck and a $\frac{3}{16}$-in. bottom deck. This screen takes out a pea gravel which is elevated by a short inclined belt conveyor into a steel bin from which this size gravel can be loaded to trucks to be used for a 60-40 gravel mixture, and some is used by concrete block plants. Throughs on the bottom deck are wasted to a pond by means of a pipe. The minus 1½- plus ⅜-in. material is moved by another 24-in. inclined belt conveyor to the heavy media separator drum.

Material is fed to the single compartment, 8- x 8-ft. drum separator, at the rate of 90 to 100 t.p.h. In the drum is the heavy pulp mixture of finely ground magnetite and ferrosilicon which is kept as closely as possible to a 2.5 specific gravity. Test runs have indicated that this specific gravity is sufficient to float off most of the slate, chert and other deleterious particles so that the material can easily meet both state and Wayne county sand and gravel specifications for paving or bituminous mixtures which call for not more than 10 percent total deleterious particles in 4-A, 10-A, and 6-A specifications. The heavy media plant, supplied by Western Machinery Co., is known as the HMS Mobil mill.

Overall view of plant showing ¾-cu. yd. dragline loading crushed gravel to hopper feeding conveyor to 3- x 10-ft. two-deck scalping and washing screen which takes out pea gravel and wastes any small remaining fines with 1½-in. to ⅜-in. gravel going to heavy media plant for removal of deleterious materials

Media Plant Operation

The 8- x 8-ft. drum-type separator revolves at 4 r.p.m. in a horizontal position on trunnions, and is kept overflowing full of media. When the material is introduced into the revolving drum, the heavier particles sink and are picked up by lifters with the material discharged through a chute at the opposite end of the drum to the 6- x 20-ft. Simplicity screen. The "float" portion, containing the deleterious materials, simply floats out the same end and is directed to part of the top deck of the 6- x 20-ft. Simplicity double-deck screen driven by a 20-hp. motor. This screen is divided longitudinally so that about 12 in. of the total width carries the "float" portion of the discharge from the separator and the remainder of the area is used to screen the "sink" portion. This screen also has two spray bars to thoroughly wash materials, one over the ⅜-in. mesh top deck and another over the ⅛-in. mesh bottom deck. The top deck has oblong or longitudinal slots. The finished float materials, mostly slate and chert, are discharged to a short belt conveyor and elevated to a steel truck bin. Finished sink materials are discharged to another inclined stockpiling belt conveyor to ground storage.

By means of an adjustable media diverter "buggy" most of the media from the screen drains to a cone-shaped sump below where a Wemco sand pump picks up the media and returns it to the drum separator. Wash water from the screen, with its entrained media, flows to a wash sump hopper from which it is pumped to a 36- x 36-in. Jeffrey drum type magnetic separator which recovers the magnetic magnetite and ferrosilicon which flows to a 36-in. by 18-ft. 10-in. Wemco densifier located immediately below. As the media discharges from the densifier, it passes through a Dings demagnetizing or "de-flocculating" coil as it is sometimes called. The purpose of the coil is to restore the media to its non-settling characteristics which were partially destroyed when the media previously went through the drum

(Continued on page 73)

Rapid progress is being made in the construction of dock facilities at Dartmouth, Nova Scotia

National Gypsum Expands Nova Scotia Operations

WITH THE OPENING of the new gypsum quarry and crushing plant by National Gypsum Co., near Halifax, and the new dock facilities at Dartmouth, Nova Scotia, Canada, sufficient raw materials will be available to expand capacity of the four eastern seaboard gypsum plants at Portsmouth, N. Y., New York, N. Y., Baltimore, Md., and Savannah, Ga., about 25 percent. According to Melvin H. Baker, chairman of the board, National Gypsum Co., the quarry development may be the precursor of manufacturing facilities in the Canadian market, where the company is not now represented. The new quarry and dock facilities will cost $6,000,000.

The gypsum deposit is 300 ft. deep with an overburden ranging from 8 to 40 ft. The first area blocked out for quarrying will measure 2000 by 3000 ft., and will be mined to a depth of 70 ft. Company geologists selected this area as it offered the highest quality gypsum with the least overburden. This area alone is expected to furnish a 30-year supply. Working in the same area, the quarry operations could proceed to four succeeding levels, each 70 ft. deep, without running out of rock. There is said to be additional gypsum of almost equal quality surrounding the entire area. The Halifax development will be a year around operation, and will supply a higher quality gypsum raw material at a lower cost.

At the quarry, the primary crusher will be located in the quarry floor. Throughs from this crusher will move by belt conveyor to a secondary crusher on the surface. The product of the secondary in turn will be moved by another conveyor belt to a 10,000-ton surge stockpile. From the stockpile, a reclaiming belt conveyor will carry the

(Continued on page 136)

Opening new gypsum quarry near Halifax, Nova Scotia. Area now being exploited will furnish a 30-year supply of material. Additional reserves are available of almost equal quality for many more years of operation

General view of plant. Primary crusher is shown to the left

Move Crushed Stone Plant to Secure New Source of Material

• D. M. Stoltzfus & Son, Inc., Talmadge, Penn., operates three quarries separated at considerable distance from each other. Uses two-way radio communication to contact various plants

By WALTER B. LENHART

THE DISTINCTION between a portable, semi-portable, and stationary crushed stone plant, at times, can be difficult. D. M. Stoltzfus & Son, Inc., Talmage, Penn., moved one of its plants almost bodily from near Cornwall, Penn., to a new location in Pennsylvania. With the exception of adding a fine grinding unit and a couple of vibrating screens to serve this crusher, the new plant looks much like the older plant. The re-built plant started operations during February, 1954.

The older Cornwall plant was built to process waste from mines operated by the Bethlehem Steel Co., at Cornwall, Penn. The processed material was in part used for the extension of the Pennsylvania Turnpike from Harrisburg to Philadelphia. The operations were described in detail in ROCK PRODUCTS, May, 1950, p. 94. A portable plant has been moved into the Cornwall site.

Located at Peach Bottom, Penn., near the Maryland state line and almost due south of Lancaster, the operation is referred to as the Cedar Hills Quarries. It is a crushed limestone operation and all materials from it are trucked to places of use. Both the original and the newer plant were designed by A. R. Amos, Jr., and associ-

Left: Two 4- x 12-ft. double-deck screens over bins. Plus material goes to 36-in. fine gyratory crusher, to the right. **Right: View of quarry** with 2-cu. yd. shovel, to the left, and crane equipped with drop ball, to the right

James Linton, plant manager in front of crane equipped with drop ball

ates of Philadelphia, Penn. The plant has a capacity of approximately 250 t.p.h.

The plant features the use of a 32- x 40-in. Telsmith primary crusher driven by an 8-cylinder Buda diesel. A 42-in. by 14-ft. apron feeder serves the primary crusher. Secondary crushers are a 13-B gyratory, and a 10- x 36-in. jaw crusher, both driven from a jack-shaft by a 6-cylinder General Motors diesel. The tertiary crusher is a 36-in. standard Telsmith gyrasphere with the newer and final crusher being a 36-in. fine grinding gyrasphere. The older cone crusher is driven by a Murphy diesel and the new 36-in. cone by a General Motors diesel. All diesels are equipped with Cycoil American air filters. For incidental electric power there is available a 187 kv.a. Electric Machinery Co. a.c. generator driven by a General Motors twin diesel. The plant has a capacity of 175 t.p.h.

Screening equipment consists of a 5- x 12-ft. Telsmith two-deck scalper and Telsmith 5- x 12-ft. and 4- x 10-ft. three-deck units as intermediate screens. Final screens that were added when the plant was re-assembled consist of two 4- x 12-ft. Cedarapids two-deck screens mounted over truck bins. They operate in closed circuit with the final reduction crusher. Belt conveyors used throughout, are 30-in. and 24-in. in width. Conveyors are all Barber-Greene. All screens operate dry.

The quarry uses a 2-cu. yd. Model 820 Lorain shovel with one Koehring Dumptor and two Euclids for primary hauling. The distance for the haul is only a few hundred feet and with flat grades. The quarry is the bench type and has a single 120-ft. face. Primary drilling is done with a rented Cyclone well drill augmented by a Cleveland wagon drill. An Osgood crane handles a drop ball for secondary work. Some jackhammer work is done using air from a Schram portable compressor. About 6 ft. of overburden is removed.

A two-way radio communications system is in use connecting the various operations. Howe scales weigh materials leaving the plant. Supplemental equipment includes an HD-10 Allis-Chalmers tractor, a Hough Payloader, and a Unit shovel.

D. M. Stoltzfus is president of D. M. Stoltzfus & Son, and Mike Stoltzfus is secretary-treasurer. Cleon Kahler is general superintendent and James Linton is plant superintendent of the Cedar Hill operations. The company operates quarries at Talmage, Penn., with a capacity of 300 t.p.h., and at Quarryville, Penn., with a capacity of 200 t.p.h.

Installs Heavy Media Separation

(Continued from page 70)

magnet separator. The de-magnetized media flows to the media return sump from which it is pumped back to the 8- x 8-ft. drum separator. The operator of the heavy media separation plant makes periodic checks to determine whether the 2.5 specific gravity of the pulp in the separator drum is being maintained. The wash hopper pump is driven by a 20-hp. motor and the media return pump by a 30-hp. motor. The drum separator motor is operated by a 7½-hp. motor.

Construction details of the heavy media plant are of considerable interest. The steel I-section columns, supporting the steel grill platform, separator drum, screen, drum magnet, densifier, and belt conveyors, are bolted to steel plates. These plates in turn are bolted to steel studs embedded in the concrete foundation and concrete piers to facilitate "knocking down" and moving to a new location, if necessary. The media sump and wash water sump, with pumps and motors, are mounted, below, on concrete piers about 3 ft. above the center of the concrete basin formed by the foundation wall rising about a foot above ground level and completely encompassing the plant. The concrete floor slopes to the center and a small motor-driven sump pump is available to pump back into the top of the media sump any media and water which may accumulate on the floor and also is a means of adding additional media.

There is considerable wear on screens due to the abrasive character of the magnetite and ferrosilicon. To reduce this wear, it is planned to use a finer grind for the media. It is also expected that the finer grind will help to prevent any clogging of pipe lines. The present fineness of the magnetite is minus 200 mesh and the ferrosilicon is minus 65 mesh.

All materials are trucked from the plant. The shale and chert rejects are disposed of by mixing with bank run road gravel for secondary road construction. No trucks are owned by the company, but four are hired. Four ¾-cu. yd. Northwest draglines are used for stripping, excavation, stockpiling and loading. A Caterpillar grader is used to maintain roads in the pit, and is also available for road construction work.

Claude Smith is superintendent of the Harry Pickitt gravel plant at Northville, Mich.

Crushing and screening plant with 10- x 36-in. jaw crusher and screen which separates sand and produces a minus 1½-in. plus ⅝-in. crushed material that is processed in the heavy media plant

Tunisian Phosphate Rock

TUNISIAN PHOSPHATE ROCK exports amounted to 461,072 metric tons during the second quarter of 1954, or 32 percent more than in the corresponding 1953 period, as recently reported in the *Foreign Commerce Weekly*. France and Italy, the major consumers, together consumed 51 percent of the 1954 second-quarter exports. Tunisian phosphate rock is mined by three companies: Gafsa, M'Dilla and Kalaa-Djerda. The Gafsa Mines, which are the largest, supplied 67 percent of the exports.

Belgian Cement

BELGIAN CEMENT PRODUCTION has increased to more than 400,000 metric tons, as compared with 271,000 metric tons during the first quarter of 1954. The increase is due largely to the revived economy and new construction programs in Belgium since the beginning of 1954.

Travelling grate with B. K. Powers, engineer and plant superintendent standing alongside

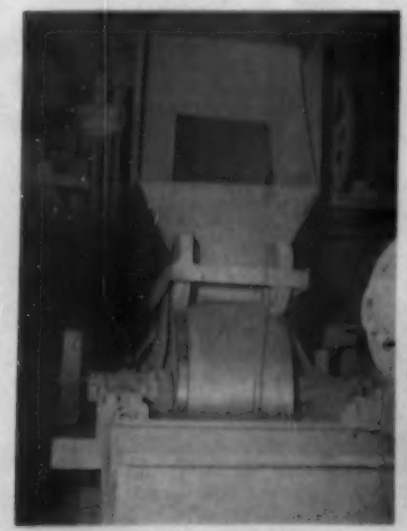
• Virginia Lightweight Aggregate Corp., Roanoke, Va., owned jointly by two producers of concrete block. Sintering system uses a fine anthracite coal, a waste mine product, for fuel

By WALTER B. LENHART

Traveling Grate Sintering System Produces Lightweight Aggregate

INTEGRATION OF INDUSTRIES all related to masonry construction, is exemplified by the cooperative activities of the Roanoke-Webster Brick Co., the Virginia Lightweight Aggregate Corp., Roanoke, Va., and the Allied Supply Corp., Charlottesville, Va. The Roanoke-Webster Brick Co., an old well-established clay brick manufacturer with operations at Webster, Va., east of Roanoke, went to the manufacture of concrete block in 1947. The November, 1949, issue of ROCK PRODUCTS, page 108, described this company's high pressure steam curing system autoclaves. In 1949, Roanoke-Webster, the Allied Supply Corp., Charlottesville, Va., and a third concrete block manufacturer in Roanoke formed the Virginia Lightweight Aggregate Corp., as cinders in the general area were becoming harder to get and the advantages of a manufactured lightweight aggregate were obvious.

An extended test program with a pilot unit was undertaken before entering into the construction of a commercial plant. The manufactured lightweight aggregate plant is across the Norfolk and Western railroad track from the clay brick operations of Roanoke-Webster. This railroad serves both plants.



Left: Clay disintegrator is the primary reduction crusher fed by apron feeder. **Right: Two gearless gyratory crushers** reduce finished lightweight aggregate to size

Sintering Process

The plant, which has been in operation over two years, uses the continuous travelling grate system developed by the Sintering Machinery Corp. The grate is 5 ft. wide and has a calcining length of 66 ft., or 330 sq. ft. Minus ⅛-in. anthracite coal used as fuel is essentially a waste product at the mines and can be classed as a "culm." Fuel amounts to 10 percent of the raw feed to the grate. The coal is delivered to the plant in open hoppers and is ready for use. The raw material is classed as a shale but contains some clay. However, it runs 80 to 90 percent shale.

Processing at the Webster operation of the Virginia Lightweight Aggregate Corp., involves disintegration of the clay-shale mixture by two J. C. Steel clay disintegrators and a smooth roll in series. These disintegrators are of the roll type; one roll is smaller in diameter than the other. The machine can be provided with smooth or shredding rolls. The net result is an abrading action that easily disintegrates the raw material. The first set of rolls takes the material down to 1½-in. after

which it is stockpiled under cover. The second disintegrator takes the material down to ¾-in. and the product through the smooth roll is approximately ¾-in. to ½-in. A Jeffrey apron feeder precedes the first disintegrator.

The above material, when mixed with the 10 percent coal and put on the grate, tended to bloat and to impede the passage of air (necessary for combustion) through the mass. To correct this condition, a small amount of finely divided burned clinker is returned to the system and intermixed with the crushed clay-shale. With this in mind, the first important step is to blend the raw material with the anthracite coal, and the fines. This is done by three belt conveyors. No. 1 belt conveyor delivers the shale to a constant level hopper that feeds to the main collecting belt conveyor. The constant level hopper, with its outlet also constant in cross section, delivers a constant weight-volume to the collecting belt conveyor. If the constant level hopper becomes full, level indicators stop the feed belt to it. The coal and returned fine clinker are similarly moved by belt conveyor to the collector belt so a constant weight relationship is made with the three ingredients. The collector belt feeds a drum-type pelletizer to which a small amount of water is added to give the mix some stability. The drum pelletizer feeds a hopper over the travelling grate.

In sintering units of this type, the coal is ignited from a combustion chamber mounted over the grate. As the bed of material (about 9 in. thick) passes under this combustion chamber the coal is ignited. A high capacity fan sucks air through the cake and supports the combustion of the coal in the mix. This obviously draws heat towards the bottom of the clinker bed, and to the top of the grate. This heat can be intense enough to damage the grate. To prevent this, some operators spread a thin layer of previously calcined clinker over the bed ahead of the hopper that receives the feed from the pelletizer. At the Virginia Lightweight Aggregate Corp.'s plant no such bed is put on the grate as the coarser material in the mix tends to run to the grate to help form its own protective bed. The grate is made up of 84 units, each 2- x 5-ft. with slots in the grate bars cast parallel to the long axis of the sintering machine. Three oil burners, burning No. 2 fuel oil, are in the combustion chamber. The plant has a capacity of 150 tons per 8 hr. or 190 cu. yd.

The grate has under it a total of six wind boxes or suction chambers that all converge to a 20- x 72-in. suction fan that maintains a vacuum on the travelling bed of 18 to 20 in. w.g. The fan is powered with a 350-hp. Westinghouse motor. Each wind box has a dust chamber that is emptied periodically. Dust impinging against the fan blades is a wear factor. The grate, which requires 10 hp. to operate it, travels from 6 to 11 f.p.m. through a variable speed drive.

Overall view of lightweight aggregate plant. Corner of raw storage structure may be seen, to the left, sintering building, center, and finished product storage, to the right

As the grate carries the burning clinker towards the discharge point, combustion in the mass is practically complete and analysis of the finished material shows the carbon content to be practically nil. At the end of the grate is a set of flat carrier rolls, about 6 ft. long, that carry the travelling bed under a set of rotating blades or knives that break the bed of clinker into 6- to 8-in. chunks or smaller. The mass is still quite hot and at night appears to be red hot. At this point, and following the knives, some of the fines are removed (mostly minus ⅜ in.). These fines are chuted to a 3- x 89-ft. Link-Belt apron conveyor serving a storage pile from which the material is eventually returned to the blending system.

The plus material following the knives goes to a 3- x 90-ft. Link-Belt apron conveyor. On this relatively slow travelling unit, the material cools sufficiently to be adequately processed in the screens and crushers that follow. Belt conveyors are used throughout for the remainder of the plant.

Crushing and Screening

Processing is built around the use of a 15- x 24-in. Traylor jaw crusher from which the material is moved by belt conveyor to an open pile for storage, cooling, and annealing. A Syntron feeder under this pile feeds the material to a belt conveyor serving a 5- x 10-ft. Tyler three-deck screen with the plus material passing to two Kennedy-Van Saun No. 37 ¼ gearless gyratory

To the right may be seen part of the 3- x 90-ft. apron feeder ahead of the cutter knives. Fines removed in plant are returned to the sintering bed to impart more porosity

Concrete block silos with spiral reinforcing. A short belt feed bucket elevator from car unloading hopper takes material to shuttle belt conveyor on top of silos. This interesting storage set-up is part of the Allied Supply Corp., Charlottesville, Va., plant, one of the companies associated in the ownership of the lightweight aggregate plant

crushers augmented by a set of smooth roll crushers. The last two reduction units handle the minus 1-in. from the screen, and the other KVS unit handles the plus 1-in. The crushing system is in closed circuit with the screen.

Three sizes of finished material are produced; ¾ to ⅜ in.; ⅜ in. to No. 4; and minus No. 4. The last two sizes can be blended for concrete block aggregates.

The finished product has the following chemical analysis:

SiO_2	56.13
Al_2O_3	23.26
Fe_2O_3	9.32
CaO	trace
MgO	1.96
SO_3	trace
Na_2O	0.21
K_2O	6.96

A typical screen analysis of the minus ⅜-in. material is as follows:

SIZE	PERCENT
Minus ⅜-in.	100
4	72.5
8	42.0
16	24.5
30	17.2
50	13.3
100	9.9
F.M.	4.2

The dry rodded ⅜ in. to 4 mesh has a weight of 44 lb. per cu. ft. and the dry rodded No. 4 to 0 weighs 59 lb. per cu. ft. All manufactured lightweight aggregate from the plant of the Virginia Lightweight Aggregate Corp. is sold under the trade name of "Weblite."

Most of the material is going out to the concrete block trade. Some is being used as roofing granules and in such concrete products as burial vaults, septic tanks, and for lightweight ready-mixed concrete. Weblite concrete weighs in the 100 lb. per cu. ft. range.

Block-Ready-Mix Plant

The Allied Supply Corp., Charlottesville, Va., owner of a half interest in the Virginia Lightweight Aggregate Corp., has a Besser-equipped block plant, is in the ready-mixed concrete business, and handles a general line of building supplies. The Besser block machine is equipped with an electronic quality control unit made by M & M Engineering Co., Indianapolis, Ind. Five curing rooms are equipped for low pressure steam curing. Lintels are made on a Kirk & Blum lintel machine.

Of particular interest to all builders of storage bins are the silos used at Charlottesville, and the manufactured lightweight aggregate plant at Roanoke. At Charlottesville, there are ten silos ahead of the ready-mixed concrete plant. Two are for portland cement and two for lightweight aggregates. They are constructed of solid 6- x 8- x 16-in. concrete block, 6-in. thick. Each block has one vertical groove at one end, and one horizontal groove that is at the top when placed in the wall. The foundation for the silos is a concrete slab that was poured 8 in. out of level. Next, the blocks were placed around the circumference so as to form a spiral. In the horizontal groove is laid the reinforcing, which in this case is a long piece of ¾-in. steel cable that is carried up in a spiral with the blocks. The cable is not cut until the silo construction has reached its designed height. The silos at both operations, including those handling portland cement, are leak-free and an observer is not aware that the foundations are out of level to the extent mentioned. The block as originally cast were designed for a 6-ft. radius but are used on 9- and 9½-ft. radii without difficulties. No vertical reinforcings are used; the vertical grooves are filled with concrete. This system of silo construction was the idea of Mr. Burruss, president of Allied Supply Corporation.

At Charlottesville the yard has been paved in small squares with concrete removed from the returning mixer trucks. A small amount of concrete pipe also is cast to utilize this material that otherwise would be wasted.

W. W. Hobbie is president of the Roanoke-Webster Brick Co., and the lightweight aggregate company. John S. Wise is secretary-treasurer. B. K. Powers is engineer and superintendent of the Virginia Lightweight Aggregate Corporation, and H. R. Flippo is plant foreman.

Wins Reporting Award

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., for the tenth consecutive year, has won honors for excellence in annual reporting. The independent board of judges in the "Financial World" Annual Report Survey named Marquette's 1953 annual report as the best in the cement industry. The company was awarded the bronze "Oscar of Industry" trophy at the annual awards banquet, held October 25, in the Grand Ballroom of the Hotel Statler, New York, N. Y., and attended by some 1400 business and financial executives from all over the United States and Canada. The trophies were presented by Weston Smith, originator and director of the annual report surveys.

A total of 5000 annual reports were considered in the international competition, the 14th in the series of surveys. These were judged in 100 industrial classifications for the "best of industry" awards. Permanente Cement Co., Oakland, Calif., was runner-up for top honors in the cement industry, while Hercules Cement Corp., Philadelphia, Penn., placed third.

P.C.A. Wins Safety Honors

THE PORTLAND CEMENT ASSOCIATION was among the 11 trade associations presented with the National Safety Council's award during the sessions of the 42nd National Safety Congress held in Chicago, Ill., October 18-22. The 11 associations were cited for their outstanding work in promoting safety in small business. The awards were presented by E. C. McFadden, council vice-president for industry, and vice-president, Texas Employers Insurance Association, at a special luncheon meeting for association executives.

The award gives recognition to associations for the general excellence of their safety services and for their contribution to the reduction of occupational injuries in their industries. In making the awards, the council's technical committee and committee of judges took into consideration accident-prevention activities such as publicity, safety conferences, contests and publication of technical material.

Can You Cut Bagging Costs Today?

• Five basic ways that may involve bagging losses and how they may be corrected by scale adjustments and bag selection

By ARTHUR J. BURKE*

FIVE BASIC WAYS that may involve bagging losses and how they may be corrected are given herewith. Weights-and-measures regulations and often customer goodwill make it necessary for a processor to set the mean weight on the bagging scale higher than the nominal weight. Thus, no bag falls short in weight. The mean weight or scale setting consequently is above the nominal weight by the amount of the maximum weight variation, resulting in a give-away of material practically in every bag.

For old, sluggish and poorly maintained scales the weight variation may be considerable. Losses may be especially high when bagging at high speed or bagging an expensive commodity. For instance, in bagging a commodity worth $.10/lb. at a rate of 12 bags/min., even a 4-oz. give-away costs $18/hr. In bagging a chemical worth $.25/lb. at a rate of 4 bags/min., a 4-oz. give-away would cost $15/hr. (Figs. 1 and 2).

*Arthur Burke, chief engineer, Richardson Scale Co.

**Bagging operation referred to throughout is applicable to bag sizes of 50-lb. and up.

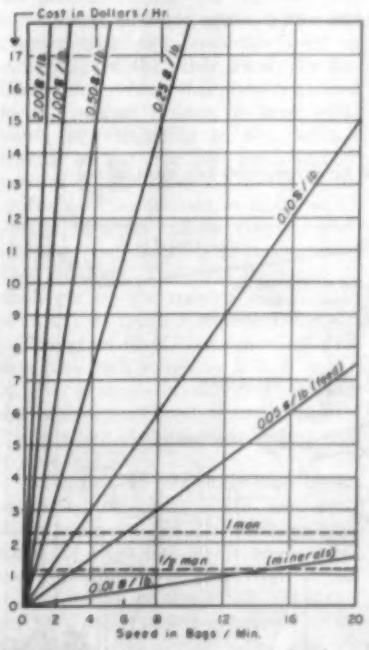


Fig. 2: Material give-away cost for 4-oz. accuracy

Excess Labor Costs

It costs $3500 to $4500 per year in process plants for one bagging operator. The amount includes miscellaneous benefits. Using the higher figure, labor costs, Fig. 3, for one and two-man bagging systems are charted for the full range of speeds.

Some installations require additional labor. Standby labor, for instance, may run as high as 20 to 33⅓ percent of ordinary labor cost. Maintenance may require one extra hour of labor in an 8-hr. shift. If it is necessary to consider both maintenance and standby labor, they may be covered by a 50 percent increase.

Wrong Bag

Bag costs,** like weighing-inaccuracy cost, varies with the speed of operation. At high speeds, it takes on real significance. For instance, a medium-priced cloth bag 1-in. too large at bagging rates of 4 bags/min., costs about $2/hr.; at 20 bags/min., $9/hr. (Fig. 4).

Bag cost depends too on type and size. Types might be considered as open-mouth (paper, cotton and burlap), and valve. Remember that changes in bag size are not uniform. Size changes, for example, in paper may be in width as well as length. In cotton and burlap, size changes generally are in circumference or length. These lengths are standardized pretty much at 30, 31, 36, 37 and 40-in.

How much more expensive is the valve bag? A valve bag performing a given bagging operation may be smaller than the open-mouth bag required to perform the same operation, because there is no extra material required for the handling and closing of the valve bag. Yet, the valve bag will usually cost more for the given operation. For example, two typical fertilizer bag sizes are: a 14½- x 3½-

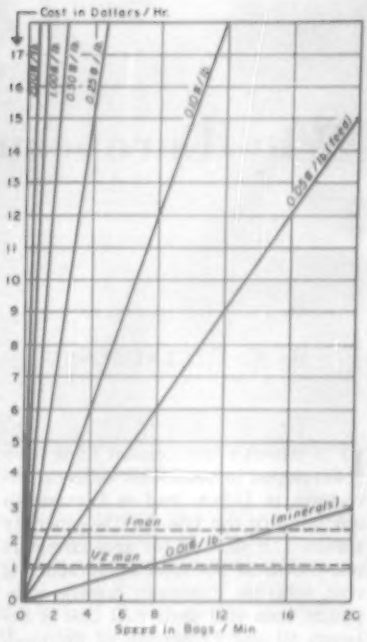


Fig. 1: Material give-away cost for 2-oz. accuracy

x 30½-in. valve bag and a 15- x 3½- x 32-in. open-mouth paper bag. The valve bag costs $.005 more than the open-mouth bag and the tape, thread and cotton filler cord used to close the bag.

When the same sizes are compared, the difference in cost is naturally greater. For example, a 15- x 5- x 30-in. valve bag (4-ply 3-60 and 150) costs approximately $.01, more than a 15- x 5- x 30-in. open-mouth bag, of similar construction, and the material used to close it.

(Continued on page 138)

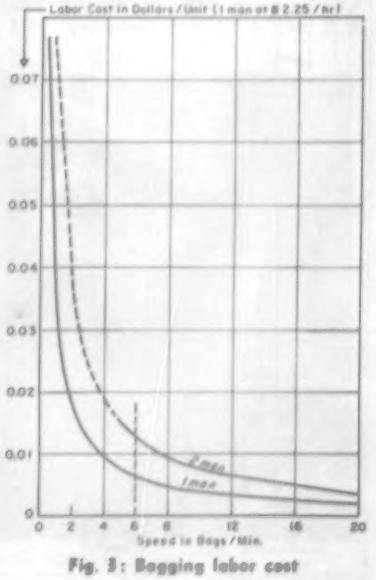


Fig. 3: Bagging labor cost

MEN or FUEL?

Why European Cement Practices Are Different

• Recent cement kiln developments in Europe, where labor cost is relatively low and fuel cost is high, point up the differences in economic conditions controlling practices in America when compared with those followed in Europe

By C. F. CLAUSEN*

IT IS OBVIOUS that cement kilns have developed in somewhat different directions in U.S.A. and in Europe. In our country the kiln fuel is generally assumed to account for approximately one-fourth of the total manufacturing cost, whereas European cement companies state that their fuel cost is between 50 and 75 percent of the total. Conversely, as labor wages are low in Europe a manufacturer over there would, naturally, see it to his advantage to spend money on more or less complicated heat utilizing equipment even if it requires considerable manual operation or supervision. In this country we find it more advantageous to obtain the same over-all economy by using large simple units which require a minimum of operating labor per barrel of production.

According to leading German cement manufacturers the cost of a new plant today in Germany is 10-12 Reichmarks per ton of annual capacity, which corresponds to about $7 per bbl. per year. Incidentally, it is interesting that figures from England, France, and Scandinavia, when converted, all result in a total unit cost of a new plant of about $7 per bbl.

The labor consumption for plants in western Germany was given as roughly 3½ man-hours per ton, or approximately 0.60 man-hours per barrel; in other words, more than twice as high as the average for America and Canada.

Typical of conditions in Germany, the coal price at one plant is nearly $20 per ton, whereas the power price is only one cent per kw. hr. Common labor is paid 30¢ an hour and the delivered price of cement is about $3.40 per bbl.

Instead of following the American trend of developing larger, more productive single units, with low overhead, the Europeans have therefore progressed in different directions. In the following will be given a few highlights of newer kiln developments as

*Manufacturing Process Manager, Portland Cement Association, Chicago.

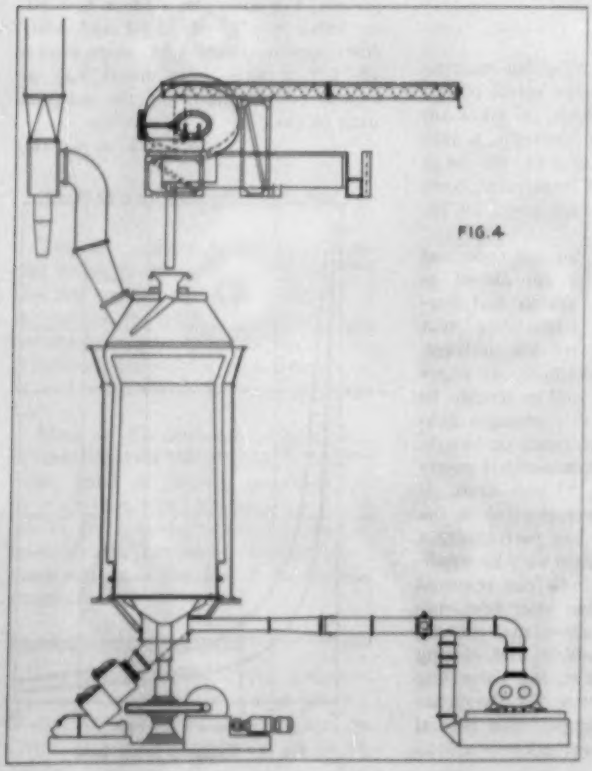
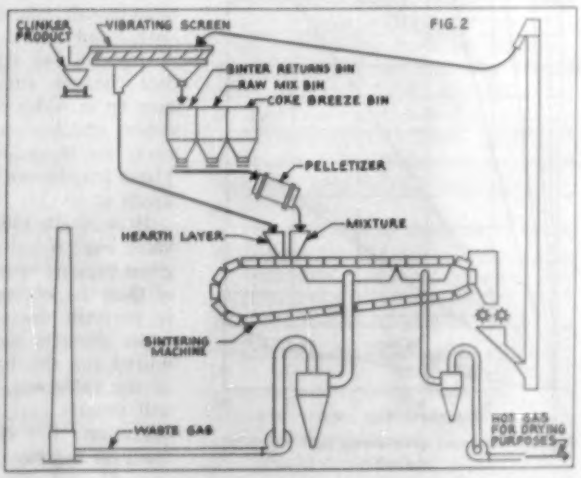


Fig. 4: Shaft kiln with disc-type nodulizer

Fig. 2: Flowsheet for sinter grate kiln installation



observed by the writer during a recent trip.

At Dotternhausen in Thuringen, the Rohrbach Cement Co. operates a sinter grate kiln, Lurgi system.

Fig. 1 shows the general arrangement of the equipment: bins (9) and (10) for ground raw materials, fine clinker, and coke; cylindrical nodulizer at top of elevator; bin for intermediate crushed clinker; feed spout; and the enclosed, slowly moving traveling grate (4). The mixture is ignited with a gas flame at (5) and from this point the down-draft combustion process is self-sustaining.

The flow is shown diagramatically in Fig. 2. Clinker leaving the kiln is crushed and conveyed to a vibrating combination conveyor and screen, where it is separated into three fractions: the finest part (considered the least burned) is returned to the nodulizer; the intermediate fraction (underburned) is used as the protecting bottom layer on the kiln-grate where it is burned again; and the coarsest fraction (considered the best burned clinker) is the finest product and goes to storage. This clinker contains an average of 2 percent free lime.

The raw materials are limestone and shale. Besides the kiln, another unusual feature at this plant is that this shale contains 12 percent oil which is gassified in retorts before the shale is pulverized; this gas is used as fuel in the ignition for the sinter grate.

The new raw materials entering the system are ground to a fineness of 10 percent residue on the 4900 mesh which corresponds to approximately 15 percent residue on our No. 200 mesh sieve; in other words, somewhat coarser than raw materials used in America. On the other hand, the finished cement from this plant is ground to a 4 percent residue on their 4900 mesh, corresponding to 6½ percent residue on our No. 200 mesh and 20 percent residue on our No. 325 mesh.

The nodules contain as much as 15 percent of water and the Polysius nodulizer or "pelletizer" is 10 ft. diameter, 16½ ft. long. The total thickness of the layer on the moving sinter grate is 16 in.; its speed 3 ft per minute.

The grate itself contains 5000 cast iron bars each weighing 3 lb. The life of a bar is approximately one year and the replacement cost three marks or 75¢ per bar. Annual replacement cost is thus $3750.

According to the Rohrbach management, the sinter grate kiln produces an average of 220 tons per day, equal to 1300 bbl., with an over-all fuel consumption of 16 percent of the clinker weight or about 750,000 B.t.u. per bbl., and a power consumption of 12.5 kw.h./bbl.

During controlled tests carried out by the "Heat and Power Committee" of the German Cement Association, the production was as high as 366 tons, or 2150 bbl. per day, with an over-all heat consumption of 1220 Kg°/Kg. which equals 820,000 B.t.u. per bbl. During these tests, however, the power consumption was only 24.8 kw.h./ton, or 4.22 kw.h./bbl.

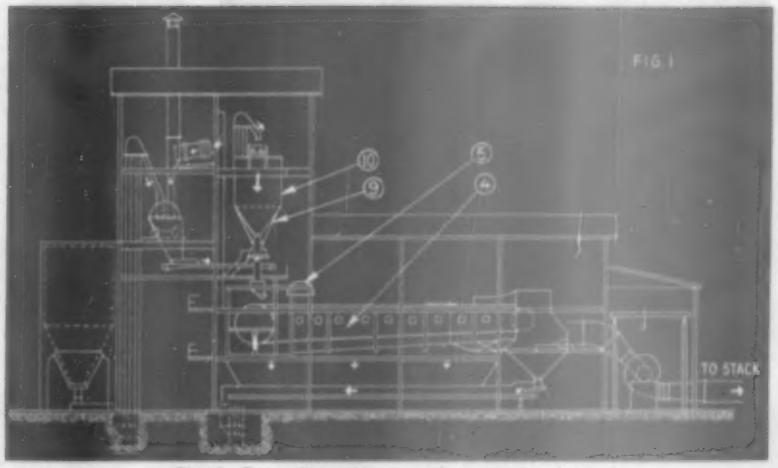


Fig. 1: General arrangement of sinter grate kiln

Another example of a dry process installation, with which, however, we are somewhat more familiar in this country, is the Lepol kiln of the Norddeutsche Cement Alemannia plant at Höver. Fig. 3 shows the newest and largest Lepol kiln equipped with a Fuller cooler. The equipment at the left includes storage bin for ground raw materials, elevator to the nodulizing drum, the feeding arrangement, and the traveling Lepol grate. The grate proper is 13 ft. wide and 79 ft. long, and the rotary kiln is 12½ ft. in diameter, 158 ft. long.

This Lepol installation is of the so-called "double-pass" type, divided into two sections so that the hot gases, after first passing through one section of the grate covered by partly dried nodules, are drawn from below through a fan, and then passed through the second half of the moving grate with its charge of wet nodules.

The plant has an ideal quarry with very uniform raw materials, making mix control easy. The magnesia in the finished cement is 0.8 percent. In the new part of the Alemannia plant, the rock is dried and ground in two single-chamber ball mills, approximately 10 ft. diameter, 12 ft. long, the rock storage containing about 12 percent water. The mills are operated in closed circuit with air separators, air-swept, and the air heated in two combustion chambers is fired with pulverized coal. The temperature of the hot gases is 1800 deg. F. when leaving the combustion chambers and 400 deg. F. when leaving the mill.

The finished raw meal has a fineness of 90 percent passing No. 4900 mesh, corresponding to approximately 15 percent residue on U. S. No. 200

Fig. 5: Installation of disc nodulizer

Fig. 6: Side view of disc nodulizer

Fig. 7: Front view of disc nodulizer

Fig. 8: Average size nodules from shaft kiln in German cement plant

mesh sieve. It is conveyed by Air Slides to blending bins and is of uniform fineness containing no spitzers, resulting in practically no free lime in the cement.

The Lepol kiln shown in Fig. 3 has a production of 24 t.p.h., or 3400 bbl. per day, more than 50 percent higher than the average long dry process kiln in America and Canada.

The power consumption, which, of course, is of importance in connection with this type of installation, amounts to 2.72 kw.h. per bbl. of clinker, including coal mill, Lepol grate, fan, kiln motor, and Fuller cooler. The Lepol grate itself is driven by a 20-hp. motor.

The heat consumption was given as 915 Kg°/Kg of clinker, corresponding to 610,000 B.t.u./bbl. The coal price at this plant was only $12 per ton with a heat value of 11,700 B.t.u./lb.

At the exit of the kiln proper the gas temperature is 1832 deg.; after the first compartment of the Lepol grate it is 390 deg. and as going to the stack following the second pass, the temperature is only 200 deg. F.

The nodulizing drum is 10 ft. in diameter, 13 ft. long. The nodules contain 12 percent water, are very hard, and survive unbroken on not only the grate but also through the rotary kiln, leaving the cooler as clinker.

The kiln is heavily instrumented, including two radiation pyrometers aimed on the lining and recording the kiln temperature. The shell is of welded construction of rather heavy plate with only a few stiffening rings.

The management believes that the Fuller cooler is very sensitive to fluctuations in the load. The plant management has not been able to ascertain that a better clinker grindability results from air quenching, but the low temperature of the clinker leaving the Fuller cooler has helped to lower the finished cement temperature, resulting in less paper bag breakage.

German operators observed that the Fuller coolers, combined with direct firing mills, always seem to increase production. This combination creates a short, hot flame, locating the burning zone close to the discharge end, and resulting in a longer effective kiln.

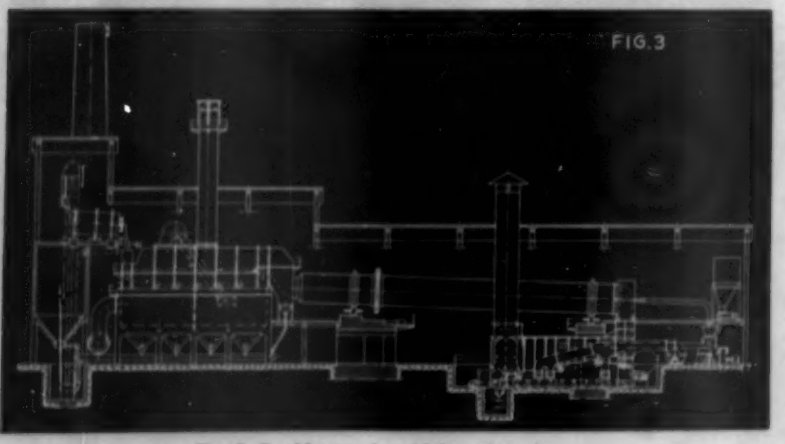


Fig. 3: Double-pass Lepol kiln with cooler

Shaft Kilns

A third type of dry process of somewhat unusual interest was observed at the Heidelberg plant at Blaubeuren, where the use of *shaft kilns* has been systemized and improved.

As shown in Fig. 4, the upper part of the kiln is cone shaped, designed to correspond to the shrinkage in volume of the raw materials during burning. The kiln, which is operated continuously at the bottom through an extremely slowly rotating system of heavy steel grates discharging into a set of air sluices. The burning process actually takes place in the upper 5 to 6 ft.

During official tests carried out by the German Cement Association, one of these shaft kilns produced 173 metric tons of clinker, equal to 1020 bbl. per day with a total coal consumption of 79 lb. per bbl., or 740,000 B.t.u.

In another test with extra large nodules, the capacity rose to 1100 bbl. per day with a heat consumption of 705,000 B.t.u. per bbl.

The amount of coal used, however, depends materially on its uniformity and quality. Before the war, the plant was able to show a yearly average of only 647,000 B.t.u. per bbl. when

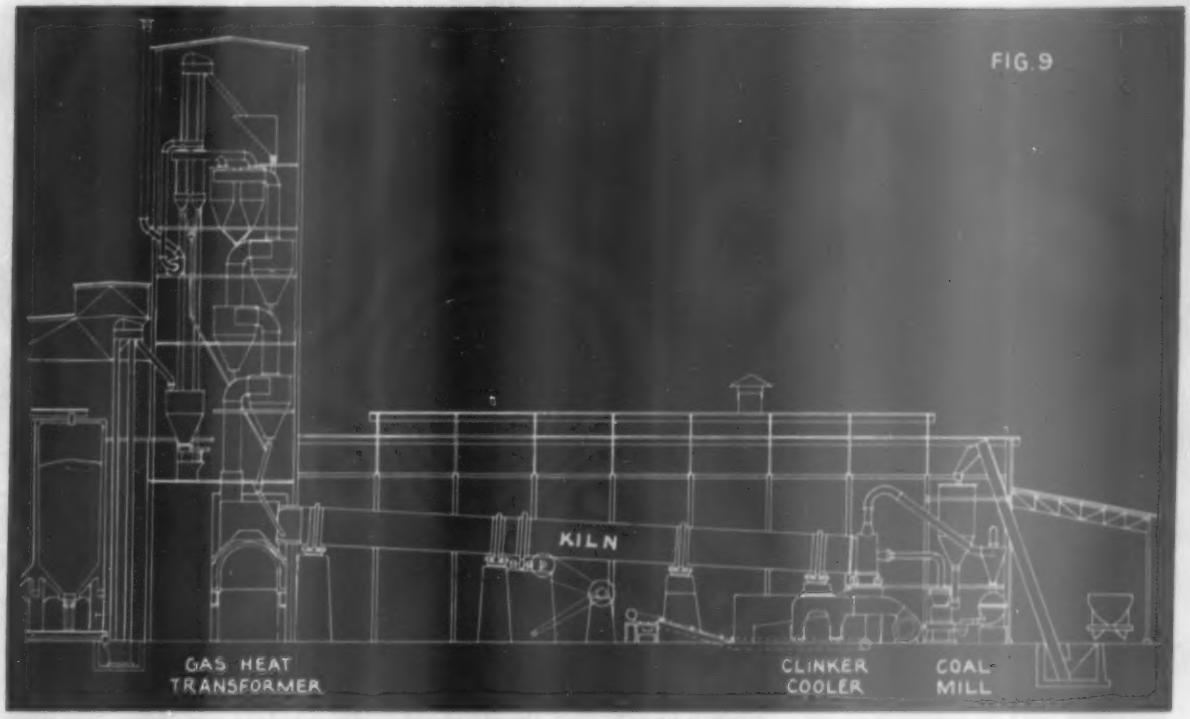


Fig. 9: Suspension preheater for short dry process kiln

using anthracite fines from a single origin.

Interesting as these figures are, it is somewhat doubtful if shaft kilns, in their present stage of development, could be used in North America with the existing prices of labor and power. Compared with an American plant where one burner-man operates several kilns, each producing 2000 bbl. per day or more, with the assistance of possibly one coal miller and one man at the feed end, the shaft kiln installation, on the other hand, with a relatively low capacity, requires a considerable number of men for operating the nodulizer, poking into the kiln at the top, inspecting the distribution of the load, adjusting the feed, and other duties. In some cases it is also doubtful if the clinker produced would be of sufficiently high and uniform quality to meet American specifications.

The nodulizer at Blaubeuren, incidentally, is of considerable interest. In addition to a paddle type and a conventional cylindrical nodulizing drum, such as described above for the Lepol installation at Höver, and as also used in America, this plant, among many others in Germany, has adopted an inclined disc-type nodulizer, shown in Fig. 5. As seen in Fig. 6, this disc can be adjusted to various degrees of inclination; furthermore, the speed, capacity, and the amount of water can be adjusted. Fig. 7 shows a front view. The principle is merely that the pulverized dry materials and water are mixed in the bottom of the disc, gradually increasing in size by snowball action, the largest nodules, as always, coming to the top and flowing over the edge (shown at the right) into conveyors leading to the kiln feed

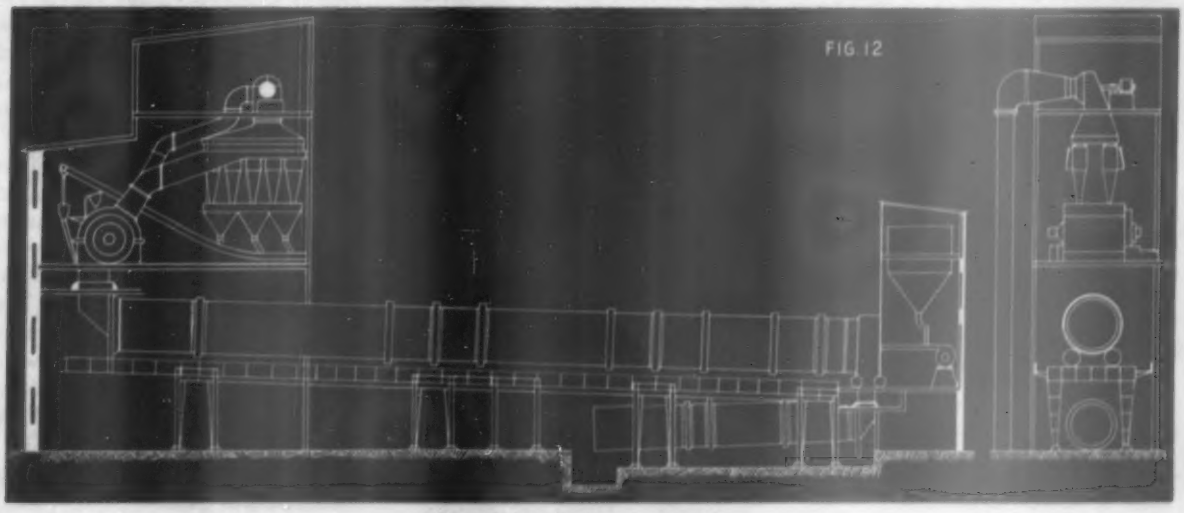


Fig. 12: Installation of calcinator

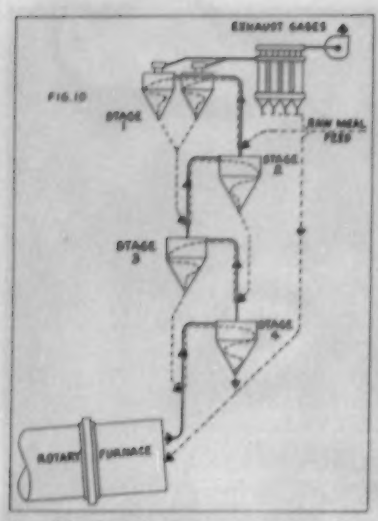


Fig. 10: Flowsheet for suspension preheater installation

spout. More so than with nodulizing drum, it seems that this disc-type nodulizer permits the production of nodules of very uniform size and hard texture. Fig. 8 shows raw nodules of average size. This nodulizer is now being marketed by a number of equipment manufacturers.

Suspension Preheaters

While the shaft kiln in effect is a revival and modernization of methods used in the cement industry years ago, the suspension-preheating system operated by Norddeutsche Hütte at Oslebshausen is new and entirely different.

After the war, this plant found itself in a precarious situation. The machinery was old and old-fashioned, dating back to 1912; the plant had been bombed heavily, and was still in the process of being rebuilt during the writer's visit. In previous years, it operated in conjunction with a steel plant using iron ore imported from Sweden and coal imported from England; both sources for some reason cheaper than if the materials had been obtained from the Ruhr. The blast furnaces are now dismantled and the cement plant relies on limestone brought in by boat, a distance of 125 miles. For the argillaceous component, the plant draws on large piles of slag left by the steel plant. It now manufactures blast furnace cement, blast furnace portland cement, and high-early-strength cement; no standard portland. In other words the slag is used not only as a raw material but is also ground in with the clinker.

Because of these handicaps and finding itself with a minimum of capital, the plant had to make a drastic change to highly economical equipment in order to survive. It now holds a record of several "firsts": (1) suspension preheaters; (2) quick dryers; and (3) centrifugal dust collecting fans.

The suspension pre-heater, shown in Fig. 9, has now been in operation for three years. The kiln proper is 8 ft. 2 in. in diameter and 130 ft. long, and its previous capacity was 710 bbl. per day.

The first step was to install direct firing equipment, which boosted the production to 780 bbl. The second step was the installation of the suspension pre-heater which brought the capacity up to 915 bbl. Finally, a Fuller cooler was substituted for the old rotary cooler, bringing the capacity up to 1145 bbl. per day.

The original kiln had a heat consumption of 1,110,000 B.t.u. per bbl.; it is now 710,000 B.t.u. per bbl., an improvement of 36 percent.

This production, incidentally, of 1145 bbl. per day is claimed to be a record high "specific production" per cubic meter of volume inside the kiln shell.

Fig. 10 is a schematic flow sheet of the Oslebshausen suspension pre-heater installation manufactured by Klockner-Humboldt-Deutz. It consists of a series of four cyclones, the fourth one in this particular installation consisting of two smaller cyclones. The hot gases, leaving the kiln at a temperature of 1832 deg. F., pass from cyclone to cyclone and finally into a mechanical dust collector from which the dust is returned directly to the feed pipe. After the last cyclone, the temperature of the gases is 430 deg.

The raw materials, entering through a somewhat crude star feeder, pass in counterflow from cyclone to cyclone, entering the kiln red hot, heated to 1475 deg. The actual exchange of heat, as in flash-drying, takes place not so much in the cyclones as in the vertical ducts, and the material drops from each cyclone into a vertical pipe before entering the next cyclone.

As in most kilns today, the burning is adjusted by regulation of fuel and draft, without changing the kiln speed and the feed rate.

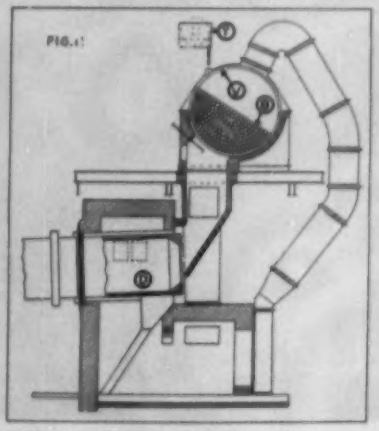


Fig. 11: Diagram of MIAC calcinator

At the point of entering the rotary kiln, the raw materials are partly calcined. Plant records showed an average ignition loss of raw meal entering the top cyclone of 27.9 percent, compared with 26.0 percent in the material discharge from the bottom cyclone; 6 to 7 percent of the CO_2 has thus been driven off.

The velocity of gases through the rectangular ducts is 83 ft. per sec.; it is estimated that the gas passes through all pipes and cyclones in about 20 sec. The fan pulling the gases through the cyclones and the dust collector consumes 75 kw.

The cyclones themselves are, in effect, dust collectors, and the plant management claimed that only 4 percent of the fresh feed was caught in the final dust collector. No appreciable de-mixing of the raw materials takes place in the cyclones and the dust is only a few percent higher in CaO than the new feed.

The clinker is burned close to the front end with a short hot flame. The kiln has occasional ash rings, which are poked out, and clinker rings which are removed with water squirts. The secondary air from the Fuller cooler has a temperature of 1475 deg. F. The finished cement contains 3.8 percent magnesia, approximately 0.6 percent alkalies and 0.1 percent free lime.

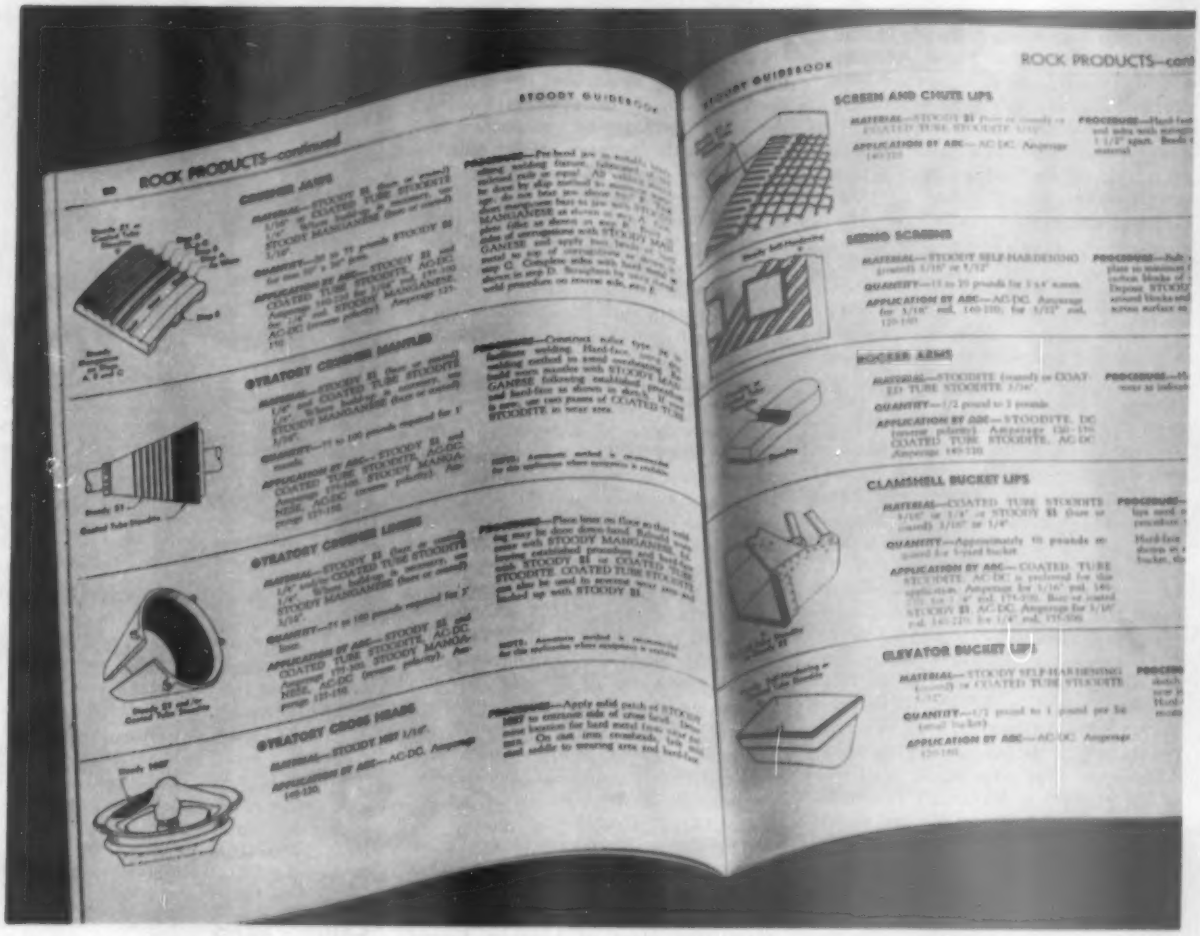
The burning zone is lined with magnesite bricks which have a normal life of one year. However, other maintenance considerations permit only a half year at a time. The three bottom cyclones were lined with 6-in. fire brick, and it was admitted that some caking of raw materials had taken place in the last cyclone and inside the down-pipe. The two top cyclones are unlined steel.

A number of suspension preheaters have been built in Germany and in South America. In this country, the first such unit was placed into production at the Evansville, Penn., plant of Allentown Portland Cement Co., (see ROCK PRODUCTS, October, 1954, page 68) by the Fuller Co. and other installations are being made. A cement company in California has been experimenting with an installation based on the same basic principle.

With a new and more efficient fan, Humboldt's engineers expected the heat consumption at Oslebshausen to drop to 560,000 B.t.u. per bbl. For new plants, and when portland cement is manufactured, the Humboldt Co. stated its willingness to guarantee a fuel consumption of 640,000 B.t.u.

It was difficult to escape the impression that among all the special heat-economizing installations used in Ger-

(Continued on page 84)



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many, this suspension-preheater should be of most interest in North America in combination with existing short dry-process kilns for increased production and improvement of fuel economy. This type of installation would require very little, if any extra labor, as opposed to the sinter grate, the shaft kiln and the Lepol installations.

Wet Process Developments

In the wet process, the improvements toward greater economy have not been quite so dramatic, possibly because wet process kilns already had reached a higher development both in Europe and here.

In addition to chain systems, a number of plants have gone in for the use of slurry thinning. The agents most often used for reduction of slurry water while maintaining a pumpable viscosity are phosphates, sodium carbonate, sodium silicate, and derivatives of lignic and humic acid. Water reduction up to six percentage points was observed.

In cement plants where slurry dispersion is a matter of routine, the weighed amounts of chemicals are dumped into cylindrical steel containers, mixed with water, and agitated. This liquid is pumped to the feed end of the primary or secondary raw mills to serve partly or totally as slurry water. An exception was one cement plant outside Paris where, according to the owners, the use of sodium carbonate had to be abandoned because the raw materials contained approximately 6 percent of gypsum; presumably the Na_2CO_3 and the $CaSO_4$ would form a collodial precipitate of $CaCO_3$ which would increase instead of decrease the water requirements.

A well-known example of a further effort to utilize the heat in the exit gases is the MIAG calcinator as used at the Heidelberg plant at Weisenau. Fig. 11 shows a diagram of this equipment. The hot gases from the kiln (D) pass through grates into a stationary drum, 13 ft. diameter and 10 ft. long, inside of which another drum (V) rotates, containing a charge of heat exchange elements (B). The slurry, fed at (T), covers these elements completely, and partly or completely dried, it passes through grate openings into the kiln.

Fig. 12 shows the entire installation at the Weisenau plant, including a cyclone-type dust collector on the suction side of the calcinator. The kiln proper is 11 ft. in diameter, 174 ft. long.

During controlled tests carried out by the German Cement Association, this kiln produced 1800 bbl. per day with a total heat consumption of 1,100,000 B.t.u. per bbl. with 38.3 percent water in the slurry. The total power consumption is 2.75 kw.h. per bbl., of which 46 percent is used by the draft fan, 10 percent for turning the calcinator, 18 percent for turning the kiln, 7 percent by the cooler, 15 percent by the primary blower, and 4 percent for auxiliary equipment.

The slurry spray system is still used by some firms, particularly Dyckerhoff Portland Zementwerke, in spite of the admittedly high dust loss. Comparative figures, on specific production and heat consumption, furnished by the Dyckerhoff management, based on observations from a number of their plants, are shown in Table 1 translated into American units.

Another type of slurry calcinator, recently introduced by F. L. Smidth, Copenhagen, is shown in Fig. 13. Just inside the feed end of the kiln, the slurry, in counter-flow with the hot gases, passes through a charge of heat exchange elements. This heat exchanging unit covers the entire cross-section of the kiln, and is divided into sectors extending outside the shell, so that the additional cross-sectional area compensates for the grates and the exchange elements. During the rotation of the kiln, the sliding action of the elements inside each sector keeps the grates from clogging up. Because of its position this pre-heater is an effective dust collector.

This slurry pre-heater is now used on a number of kilns in Europe. The much publicized 12 ft. 4 in. x 15 ft. 1 in. x 445 ft. long Unax kiln at the Cormeilles plant of Lambert Freres outside Paris, for example, produces 6000 bbl. per day with 41.7 percent water in the slurry, and a heat consumption of 925,000 B.t.u. per bbl.

At the Aalborg Portland Cement Co. plant at Rordal, Denmark, an 11 ft. 9 in. x 10 ft. 8 in. x 11 ft. 9 in. x 503 ft. long kiln, also equipped with this calcinator, produces 4000 bbl. per day with a heat consumption of only 860,000 B.t.u. per bbl. with 36 percent water in the slurry.

Fig. 13: Kiln equipped with F.L.S. calcinator

Table 2 presents a highly condensed summary of the performance of some of the aforementioned foreign kilns and for comparison, some average figures for typical kiln installations in U.S.A. It will be noted that only the most modern Lepol kilns and shaft kilns, both high in labor requirements, have better fuel efficiency than the best installations in this country.

Cement Sales

THE SOUTH DAKOTA STATE CEMENT PLANT COMMISSION has reported that the volume of business for 1954 was the biggest in the plant's history, and that the 1955 outlook is even better. The commission expects an increase in sales when contracts are let by the Corps of Engineers for use of cement at the Oahe dam.

Dyckerhoff Portland Cementwerke, A/G	Specific Output lb./day/sq. ft. inside lining	Heat Consumption B.t.u./bbl.
Slurry Spray System	62.5-68.5	890,000-1,120,000
Long Wet Process Kilns	37.5	925,000- 990,000
Dry Process with Nodulization	72	
Dry Process without Waste Heat	—	925,000- 990,000
Dry Process with Waste Heat	—	795,000- 860,000

Table I: Comparison of slurry spray with conventional wet and dry process

Table 2.			Performance		
			Heat Consumption B.t.u./bbl.	Power Consumption Kw.h./bbl.	Production Bbl./day
1.	Dry Process, Lepol Grate	Europe	810,000	2.7	2400
2.	Dry Process, Spohn Shaft Kiln	Europe	705,000	4.0	1100
3.	Dry Process, Humboldt Preheater	Europe	710,000	9.0	1145
4.	Dry Process, Long, best	U.S.A.	712,000	4.0	1778
5.	Dry Process, Lurgi Sinter Grate	Europe	780,000	12.5	1300
6.	Dry Process, Lepol	U.S.A.	756,000	4.6	1000
7.	Dry Process, Long, average	U.S.A.	890,000	6.1	2070
8.	Wet Process, FLS Calcinator	Europe	893,000	—	5000
9.	Wet Process, Long	Europe	960,000	—	———
10.	Wet Process, Slurry Spray	Europe	1,055,000	—	———
11.	Dry Process, Waste Heat	U.S.A.	1,097,000	5.0	2330
12.	Wet Process, MIAG Calcinator	Europe	1,100,000	2.8	1500
13.	Dry Process, Short	U.S.A.	1,240,000	5.5	740

Table II: Comparison of recent European kiln types with typical American installations

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Concrete Division Laboratory and office building

Thos. B. Kennedy, chief of Concrete Division, Waterways Experiment Station

By BRYANT MATHER*

AGGREGATES For Corps of Engineers Construction

• Requirements and operations of Waterways Experiment Station summarized as they apply to aggregates for lower Mississippi Valley construction. Exhaustive regional surveys of deposits and maps available for study by producers

LARGEST USER OF AGGREGATES in the Lower Mississippi Valley is the Corps of Engineers. Flood control and navigation works along the Mississippi River and its tributaries in the stretch from slightly above St. Louis to the Gulf of Mexico involve navigation locks and dams, flood-control and multiple-purpose dams, floodwalls, pumping stations, spillways, jetties, embankments, revetments, and other structures. Aggregates are required in large quantities for concrete work both massive and structural, for use as filter sands and gravels, and for riprap.

These materials are selected, specified, inspected, and used in accordance with standard Corps of Engineers procedures. The Mississippi River Commission with its headquarters in Vicksburg, Miss., is the nerve center from which the work of the Corps of Engineers in this region is directed and coordinated.

The first levee to hold back Mississippi River flood waters was constructed by the French Government at New Orleans in 1717. This was the beginning of flood control work in the Lower Mississippi Valley. By 1844 west-bank levees extended almost continuously as far north as the Arkansas River. In 1845 John C. Calhoun expressed the view that flood protection was a national problem. The War Department established the "Levee Commission" in 1874 to prepare a flood control plan. These activities led to the establishment of the Mississippi River Commission in 1879. The Commission will celebrate its 75th anniversary in the fall of 1954.

Vicksburg is also the headquarters of the Lower Mississippi Valley Division, the Vicksburg District, and the Waterways Experiment Station. The president of the Mississippi River Commission serves also as division engineer of the Lower Mississippi Valley Division. The three other districts in the Lower Mississippi Valley Division have their headquarters, respectively, at New Orleans, Memphis, and St. Louis.

The Waterways Experiment Station was established in 1929 to provide a hydraulics laboratory to serve the Mississippi River Commission. It now includes three principal divisions: Hydraulics, Soils, and Concrete, that, in addition to their function as the division laboratories for the Mississippi River Commission and the Lower Mississippi Valley Division, are the principal research, development, and testing facilities of the Corps of Engineers in these fields. The Soils Division and Hydraulics Division, except for one activity, are located at Vicksburg; the Concrete Division and the hydraulic model of the Mississippi River Basin are located near Jackson, Miss.

Samples of aggregates being considered for use in the Lower Mississippi Valley are tested at the Waterways Experiment Station by the Soils and Concrete Divisions — filter sands and gravels for use in connection with earth embankments and foundations by the Soils Division laboratories in Vicksburg; concrete aggregates and riprap by the Concrete Division laboratories in Jackson. Each of these Divisions also contributes to the development and implementation of Corps-wide policy and procedures through its participation in the Civil Works Investigations Program under the direction of the Office, Chief of Engineers.

A typical project might begin with a geological investigation of the area in which a proposed structure is to be located. Drilling parties make borings as necessary for geological study and also obtain sufficient samples for engineering studies.

The Geology Branch of the Soils

*Chief, Special Investigations Branch, Concrete Division, Waterways Experiment Station, Corps of Engineers, U. S. Army, Jackson, Mississippi.

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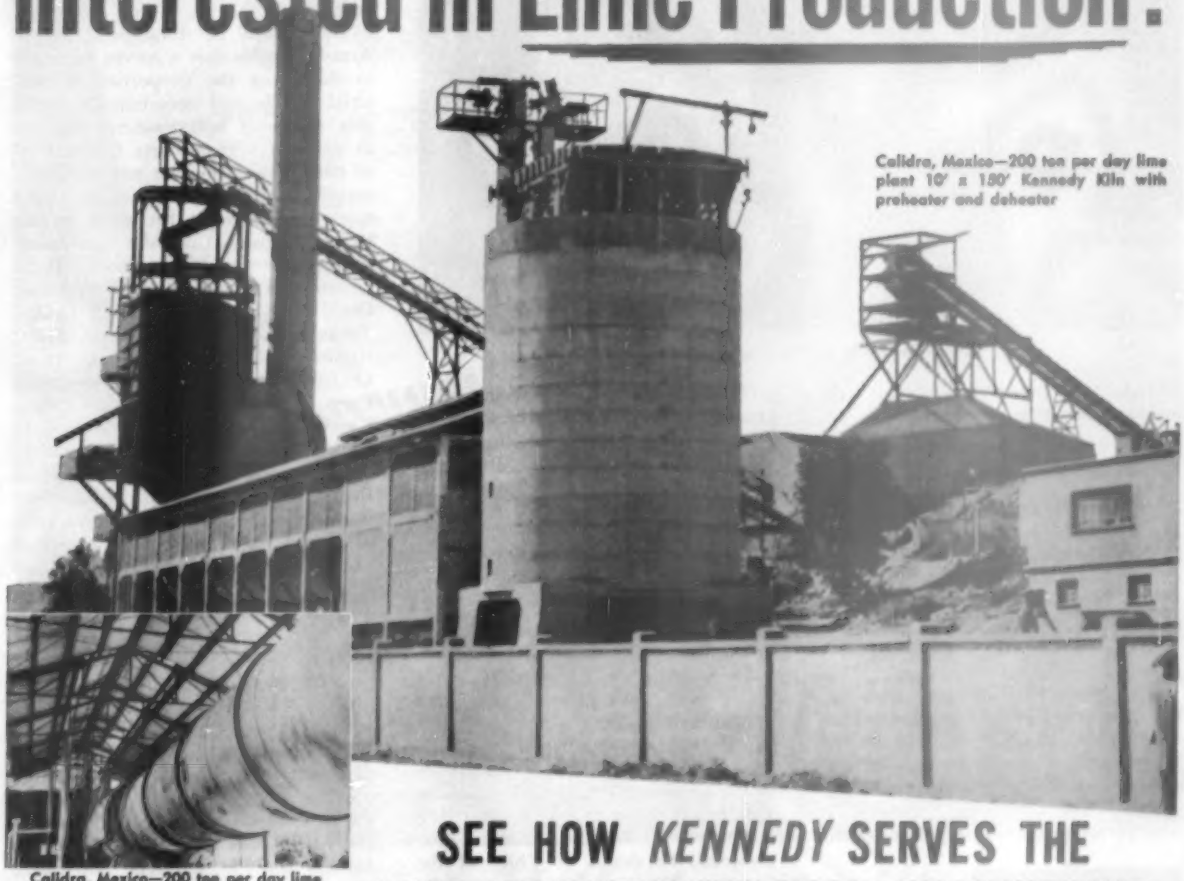

Calidra, Mexico—200 ton per day lime plant 10' x 150' Kennedy Kiln with preheater and deheater

Calidra, Mexico—200 ton per day lime plant 10' x 150' Kennedy Kiln with oil pre-heating coils looking towards firing end

Calidra, Mexico—200 ton per day lime plant 10' x 150' Kennedy Kiln with oil burner

Calidra, Mexico—200 ton per day lime plant 10' x 150' Kennedy Kiln with preheater and deheater

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A portion of the soil mechanics laboratory

Division is engaged both in short term studies related to sites of specific engineering projects in the Lower Mississippi Valley and also in a long-term project to develop information on general geology of the valleys of the Lower Mississippi River and certain tributaries.

The Soils Division is directed by W. J. Turnbull, its Embankment and Foundation Branch by W. G. Shockley, and its Geology Branch by J. R. Schultz.

The Concrete Division performs concrete investigations on problems of a general nature, applicable to the Corps of Engineers as a whole, as part of the Civil Works Investigations program of the Corps of Engineers. It also performs investigations on special problems applicable to specific projects when authorized by the Chief of Engineers. It acts as Division Concrete Laboratory for the Mississippi River Commission and the Lower Mississippi Valley Division, providing service in connection with project design and construction control.

Drill rigs are available to all Corps of Engineers offices for obtaining soil samples. The samples are sent to the Waterways Experiment Station soil testing laboratory for analysis

Largest User of Concrete

Since the Corps of Engineers is one of the largest users of concrete in the world and since its concrete structures are of many different sizes and types built for use under widely different conditions of service and exposure, the scope of the concrete investigations of the Corps of Engineers is properly very broad.

Thomas B. Kennedy has recently assumed the duties of Chief of the Concrete Division. He is especially well qualified to serve as head of the concrete laboratory work for the Lower Mississippi Valley Division since he was associated with the construction program of the St. Louis District from 1931 to 1939. J. M. Polatty is Chief of the Concrete Branch of the Concrete Division.

Aggregate Survey

The Waterways Experiment Station conducted an aggregate survey of the Lower Mississippi Valley Division in 1948-1949 at the request of the president of the Mississippi River Commission. This survey involved an intensive field search of the area within economic range of nine selected project sites and a survey of the entire Division and the adjoining region for sources of riprap material. The results of this work provided information on the relative characteristics of aggregate materials from several hundred sources in the area and, in the case of riprap, on materials from 48 sources in Oklahoma, Texas, Arkansas, Missouri, Louisiana, Kentucky, Tennessee, Mississippi, and Alabama. At the time the survey was made it was estimated that nearly 1,000,000 cu. yd. of riprap would be required in connection with nine specific proposed projects.

The Corps of Engineers, U. S. Army, requires that a survey be made to determine the properties of material locally and economically available that may be considered for use as aggregates in concrete for each of its construction projects wherever they may be located. This aggregate survey work is conducted for each project by the Division Concrete Laboratory nearest the site of the work. These laboratories are located in Portland, Ore.; San Francisco, Calif.; Dallas, Texas; Omaha, Neb.; Jackson, Miss.; Atlanta, Ga.; and Cincinnati, Ohio. Under the Civil Works Investigations Program sponsored by the Office, Chief of Engineers, the Waterways Experiment Station began in 1950 to compile on standard data sheets all of the information developed since 1946 in connection with aggregate surveys. The data which have been compiled up to the present time cover 1210 sources of material located within the continental United States. A data sheet has been prepared on each of these sources. The United States has been divided into rectangles each one degree of longitude in an East-West direction by one degree of latitude in a North-South direction. A map of each of these rectangles has been prepared and the aggregate sources plotted on the appropriate map. The 1210 sources for which data are now available are located on 333 different one-degree maps. The United States has been divided into ten areas: Area 1 includes the Pacific Coast west of longitude 120; Area 2 includes the Northwest, north of latitude 40, west of longitude 110; Area 3 is the Southwest, south of latitude 40 and west of longitude 110; Areas 4, 5, 6, 7, 8, and 9 are alternately north and south of latitude 40 and include the sections, respectively, west of longitude 100, 90, and 80; and Area 10 includes that part of the United States east of longitude 80. The data pertaining to Areas 1-5, including 252 localities on 83 maps, have been compiled in Volume I of the compilation of data. Volume II, covering Areas 6 and 8, includes 221 sources on 61 maps. Volumes III, IV, and V, covering Areas 7, 9, and 10, include, respectively, 281, 290, and 166 sources located in 70, 76, and 43 map areas.

The five volumes of data have been published by the Waterways Experiment Station and distributed to appropriate Corps of Engineers District and Division Offices and Division Laboratories for information and reference. The volumes consist of loose-

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leaf binders and individual sheets with appropriate introductory matter and maps. Arrangements have been made for each of these laboratories to furnish to the Waterways Experiment Station additional data as they are developed. Annually the Waterways Experiment Station will distribute supplementary sheets to be inserted in the compilation — thereby keeping it complete and up to date. It is anticipated that as a result of the existence of this compilation, the costs for the investigation and study of additional samples from aggregate sources previously studied will be reduced and that the cost of aggregate surveys for future projects will thereby be lowered. Although it is not feasible to issue these publications to private organizations and individuals, the data contained therein may be examined by such organizations and individuals, upon request, at any Corps of Engineers District or Division Office or Laboratory. In this connection, the Director, Waterways Experiment Station, will maintain several complete sets of these volumes to be made available on loan.

Users of these data have been cautioned to consider the results given as indicative of the properties of the sample which was tested but not necessarily indicative of the properties of the material which may be produced from these sources in the future. Each data sheet includes the date on which the sample was taken and the name of the laboratory at which it was tested. All of the data were obtained by the use of the methods of test which have been standardized by the Waterways Experiment Station and published for the use of the Corps of Engineers in the *Handbook for Concrete and Cement*, the maintenance of which is also a part of the Corps of Engineers program of Civil Works Investigations.

Aggregate test data from sources in the Lower Mississippi Valley region are included in Volumes II, III, and IV since the Lower Mississippi Valley Division includes territory between longitude 88 and 97 and latitude 28 to 41.

The Civil Works Investigation program related to concrete, conducted by the Concrete Division, has provided and is now providing a coordinated study of means of improving the quality and economy of concrete. It has paid greatest attention to large-aggregate concrete for use in massive structures since least was known about such concrete and the Corps of Engineers is the largest user of such material. The laboratory pioneered in devising procedures to enable the Corps of Engineers to realize advantages of air-entrainment. Another study produced

Section of the chemical laboratory of the Concrete Division

the design of the first satisfactory 8-cu. yd. bucket for handling low-slump mass concrete. Its study of the effects of aggregate grading on the properties of concrete yielded data that are reflected in current specifications for concrete aggregate for Corps of Engineers construction. The correct use of air-entrainment and aggregates of proper and properly controlled grading has permitted the reduction in the amount of portland cement in mass concrete, and thereby its cost, while actually increasing some of its desirable properties. On several projects the amount of portland cement used has been as low as 2½ bags per cu. yd. of concrete. It is conservatively estimated that a saving in construction materials costs of over $4,000,000 has been realized by these activities. Further studies designed to provide additional improvements in quality and economy are now in progress.

A major study is being made of finely-divided mineral substances that may be used to replace part of the portland cement in concrete. It is indicated that the proper use of some of these materials will not only effect a saving in cost but will also improve the quality of the concrete with respect to volume stability and impermeability.

Tests for Military Program

A third phase of the work of the Concrete Division is in connection with the military construction program of the Corps of Engineers. The Division regularly performs acceptance testing of air-entraining admixtures and membrane-forming curing compounds for concrete pavements and other military construction activities in the southeastern United States. During and after World War II, its principal activities concerned testing of cement, aggregates, and other concrete materials; development of mixture proportions and testing of concrete for military construction. Between 1941 and 1945 it sampled and tested more than 3,000,000 bbl. of portland cement made at 31 mills for use on nearly 200 projects, including 70 airfields, and a number of gun blocks, target butts, and other military structures. Between 1943 and 1946 nearly 300 slabs cut from pavements at 30 military airfields were tested for compressive and flexural strength in order to evaluate their load-bearing capacity.

The military projects for which concrete and concrete materials have been tested include most of the airfields, camps, and ammunition depots in the eastern United States as well as similar installations in Newfoundland, Bermuda, Puerto Rico, Antigua, Brazil, British Guiana, Panama, Hawaii, and Iceland. Investigational work on materials, conducted by the Concrete Division, formed the basis for specifications, recommended practice, and methods of acceptance testing for membrane-forming curing compounds and air-entraining admixtures. These materials, now used in nearly all military and civil concrete construction, have improved the quality of concrete and reduced its cost very materially. The laboratory has made special studies of concrete and other materials by chemical, physical, X-ray, and microscope methods, and to determine the composition and properties of soil and foundation materials from Iceland, Africa, Panama, Greenland, and other localities in which important military work was being conducted. In a number of cases, laboratory personnel and equipment have been called upon to visit military projects and conduct tests at the site. At an airfield in New Hampshire, laboratory personnel conducted tests to correct an undesirable condition in which excessive air-entrainment was occurring to the detriment of the strength of the concrete. At a major coast defense establish-

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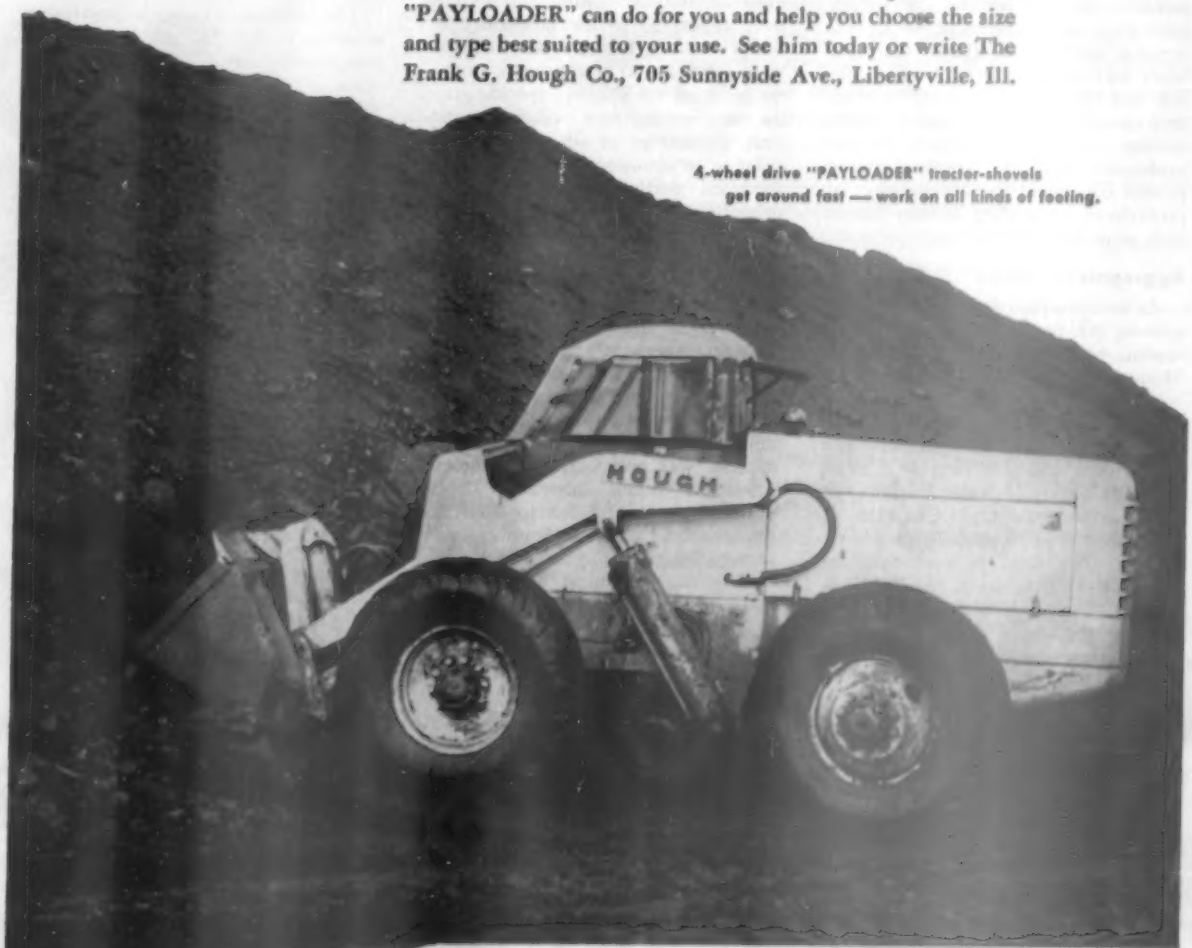

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Completed test blocks of concrete, forms, 2-cu. yd. controlled discharge bucket and diamond core drill rig used in connection with investigations of quality and placement characteristics of lean mass concrete. Four of the blocks contain concrete in which part of the portland cement has been replaced with another, less expensive material

ment in South Carolina, laboratory personnel and equipment took diamond-drilled cores from the gun block and casemate structure to establish that the concrete was of satisfactory quality even though test cylinders molded during construction showed inadequate strength. Another special project concerned the development of procedures for loading dummy bombs with sand for practice bombing tests.

Aggregate for Dams

As an example of the use of aggregate in the Lower Mississippi Valley region, let us consider the Blakely Mountain Dam. This structure is located on the Ouachita River near Hot Springs, Ark., at the head of Lake Hamilton. It is a flood-control and power dam and will provide a more constant supply of water for two Arkansas Power and Light Co. dams — Carpenter and Rommel — downstream. The dam is essentially an earth fill 1200 ft. long, rising 230 ft. above the river bed. Dumped riprap protects the entire downstream slope and the upstream slope from the crest down to 10 ft. below the minimum power pool. It impounds runoff from an 1105-sq. mi. drainage area; the storage capacity is 2,768,000 acre feet of which 617,000 is entirely for flood control. The spillway consists of a 200-ft. wide cut having a 50-ft. section with a paved bottom and side slopes located about 1 mi. west of the dam. Two concrete-lined tunnels each about 1800 ft. long with diameters of 19 and 30 ft. are provided in the right abutment. Concrete to provide linings 2 and 2½ ft. in thickness was placed by Pumpcrete.

The portals, stilling basin, tunnel, and outlet were of concrete. The aggregate investigations for Blakely Mountain were begun in 1946. Samples of sand and crushed stone from the most economical commercial sources were submitted to the laboratory by the Vicksburg District. The samples were subjected to petrographic examination, tests for grading, specific gravity, absorption, unit weight, soundness, percentage of silt and clay, resistance to abrasion, presence of soft particles, particle shape and other properties. Concrete made with portions of the samples was tested for resistance to accelerated freezing and thawing and for thermal properties. It was concluded that the material would be satisfactory for use provided satisfactory gradings were maintained and steps were suggested to improve particle shape of the coarse aggregate. In 1948 an undeveloped deposit of sand and gravel in a valley near the damsite was prospected and samples submitted to the laboratory. These samples were subjected to the same examinations and tests. Some fractions showed relatively high absorption and loss in the soundness test. Early in 1949 tests were made on sand and gravel from a commercial source and mixtures especially designed for placement by Pumpcrete were developed, using the cement that would be used in the work. In the summer of 1949 the contractor located a quarry site in a valley near the project. The site was sampled by core-drilling and blasting and 16 cores, total length 1230 ft., and 5 tons of ledge rock were submitted together with 1500 lb. of sand for laboratory evaluation both for use as concrete aggregate and as riprap. The limestone was found to possess no features which would tend to make it unsatisfactory for use as concrete aggregate or as riprap. Based on the core logs and locations a proposed quarrying plan was developed. In 1950 samples from a sandstone outcrop upstream from the damsite were tested for suitability as riprap.

Concrete Revetment

Another important use of aggregates in the Lower Mississippi Valley region is in the making of articulated concrete revetment. The articulated concrete mattress has been developed over many years of study to become the standard underwater revetment on the river banks in this area. The program includes protection from Cairo, Ill., to Baton Rouge, La., involving 425 miles of revetment.

A revetment consists of two parts; the mattress, placed below the water surface; and bank paving extending from the water surface to the top of the bank. The mattress comprises more than three-fourths of the structure. Before the mattress is placed, the slope is graded to about 20 ft. below the water surface to a slope between 1 on 3 and 1 on 5. A 4-in. gravel blanket is placed on the slope.

The articulated concrete mattress is made up of 4- x 25-ft. "squares," each composed of 20 concrete block; 3 ft. 10½ in. long, 14 in. wide, and 3 in. thick, spaced one inch apart on heavy noncorroding reinforcing and articulating wire fabric. The block are bevelled so that the effective opening is ¾ in. The fabric consists of three longitudinal wires continuous through the length of the unit and looped at the ends to facilitate joining, and rectangular brackets for transverse reinforcing which provide a means of fastening units together and for attachment of launching cables.

Manufacturing fields have been located along the river at many strategic sites including Cates Landing, Tenn.; Caruthersville, Mo.; Richardson Landing, Tenn.; Helena Ark.; Greenville, Miss.; Delta Point, La.; and Vidalia, La. The casting and storage capacity of these fields ranges from 32,000 to 130,000 units per working season. The concrete used in making the block is designed for a 7-day compressive strength of 2000 p.s.i. It is mixed centrally, transported to the forms, and deposited. The concrete is consolidated by vibration, struck off, and cured by a membrane-forming compound sprayed on the surfaces. The squares are cast in stacks, normally 12 high, separated by two thicknesses of heavy Kraft paper.

The Concrete Division has cooperated with the districts in the Lower Mississippi Valley Division in connection with many phases of the concrete work in the articulated concrete mattress program. Samples of sand and gravel have been examined and tested. Membrane-forming curing compound, air-entraining admixtures and, in cases of emergency, portland cement samples have been tested. Investigational work has been done to determine the

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effects of the use of hot cement, the relative performance of air-entrained versus non-air-entrained concrete mixtures, and the possibility of using a curing compound to replace one of the Kraft paper separation layers. A mechanized, automatic plant for producing articulated concrete mattress squares on a production line basis has recently been put into operation at Greenville, Miss. The magnitude of the operations involved in the revetment program may be judged from the fact that it has cost over $200,000,000, and more than $120,000,000 additional are estimated to be required.

Certain Cherts Acceptable

Narrows Dam is one of the few concrete gravity dams in the Lower Mississippi Valley area. It is a multiple-purpose flood-control and power project located on the Little Missouri River about 7 miles northwest of Murfreesboro, Ark. Construction was begun in 1947 and completed in 1950 at a cost of $13,450,000.

The dam consists of two abutment sections, a flood-control section with two regulated outlets, an uncontrolled ogee spillway section 150 ft. long, and a power intake section. It contains 300,000 cu. yd. of concrete. The drainage area is 237 sq. mi. and the reservoir has a storage capacity of 408,000 acre feet at flood-control level. Aggregate investigations for Narrows Dam were begun in 1946 with the sending of samples of locally available sand and gravel to the laboratory. Portions of the samples in each sieve fraction from sand to 6-in. were examined petrographically. Other samples were subjected to tests both as received and in concrete. Since the principal constituent of the coarse aggregate was chert, special attention was given to tests for unsoundness of the type often exhibited by porous chert and for potential deleterious reactivity with cement. As a result of these tests, the samples were reported as having no features revealed by the tests indicating that the material would not be satisfactory for use as aggregate. In 1947 another series of tests were made on additional samples submitted to verify the previous work and to develop mixture proportions for use in construction. The properties of these aggregate samples were found to check those of the previous samples. Mixtures were proportioned using 1½-in. aggregate for structural work (floors, columns, stairs, etc.); using 3-in. aggregate for the stilling basin, draft tubes, etc.; and using 6-in. aggregate for the mass of the dam. The testing, by which it was established that locally available natural materials were satisfactory for use as aggregate for this structure, in spite of the fact that they consisted in large part of chert, avoided the necessity of a large increase in cost. The use of the next nearest available source of aggregates would have added nearly $1,500,000 to the cost.

Greenville casting field where a spreader is distributing concrete in forms for the manufacture of concrete revetment

Testing Aggregate at Source

The standard practice of the Corps of Engineers with regard to aggregates for use in Civil Works Construction has recently been published in Part CXX of the Engineering Manual, issued by the Office, Chief of Engineers. This standard practice calls attention to the importance of investigation and selection, during planning and design of a project, of suitable sources of aggregate for the production of economical high quality concrete. Locally available materials will be used. For smaller projects, commercial sources will be used when they are available within economic range. All sources determined to be economically competitive will be investigated and as many as are determined acceptable from a quality standpoint will be listed in the specifications as approved sources.

Preliminary testing will consist of petrographic examination and physical tests such as specific gravity and absorption. Service record data will be developed wherever possible. Detailed testing will include additional petrographic examination; specific gravity; absorption; organic, clay and other impurities; resistance to abrasion; chemical reactivity; freezing and thawing in concrete; and mortar-bar tests if petrographic examination and chemical reactivity tests indicate the need for it.

Final testing may include an aggregate processing study to determine crushing and grinding characteristics, particle shape, and waste. The program to determine concrete-making properties will include mortar-strength tests of the fine aggregate, influence of sand grading on cement factors and water requirements, and basic strength data. Thermal properties of both the aggregates and of concrete made from them will be determined. These properties include specific heat, conductivity, diffusivity, and thermal expansion. When several commercial sources are approved, the project specifications will provide that material can be furnished from any one of those listed or from another source not listed. If the latter, samples must be tested to demonstrate their acceptability. If they are not acceptable then aggregate must be furnished from one of the listed sources. Approval of a source does not imply approval of all materials from that source.

Aggregates, as delivered to the mixers, shall consist of clean, hard, and uncoated particles. For most projects, the grading requirements for fine aggregate are:

SIEVE	PERCENTAGE PASSING BY WEIGHT
No. 4	95-100
No. 8	80-90
No. 16	55-75
No. 30	30-60
No. 50	12-30
No. 100	3-10

The fineness modulus must be between 2.40 and 2.90 and at least nine of any ten test samples shall not vary more than 0.15 from the average fineness modulus of all previous samples.

For less important work the requirements may be relaxed to provide:

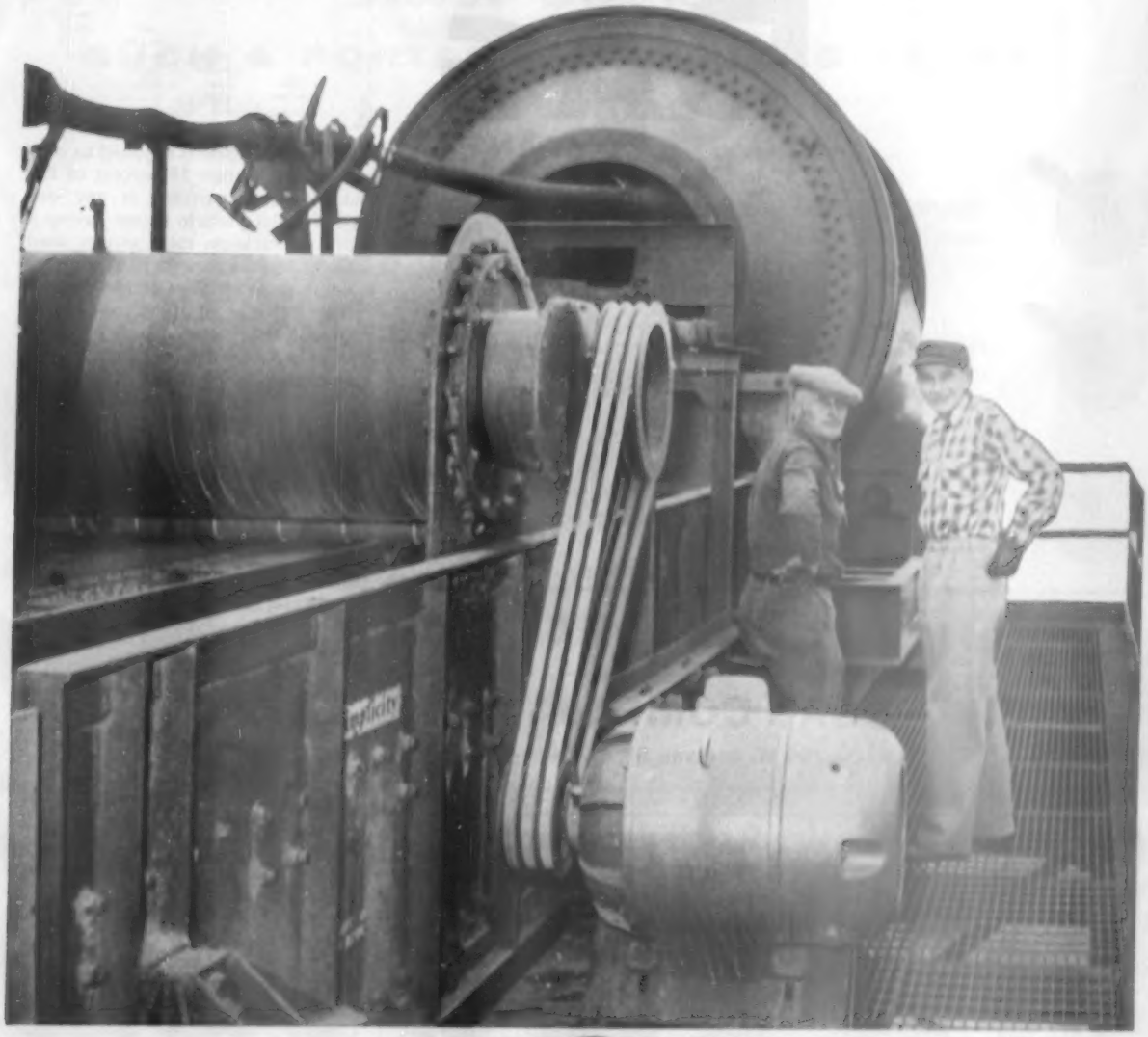
SIEVE	PERCENTAGE PASSING BY WEIGHT
⅜ in.	100
No. 4	95-100
No. 16	45-80
No. 50	10-30
No. 100	2-10

For large projects requiring low cement-factor concrete the following more severe requirements will be used:

(Continued on page 96)

Simplicity screens play important part in remarkable new "sink-float" plant producing improved gravel

Progressive sand and gravel plants throughout the country are turning to the "sink-float" or heavy media separation method to produce an improved quality grade of gravel. This method insures the positive elimination of troublesome non-durable materials. The installation shown below was made by the Western Machinery Co. of San Francisco, Calif., at the Harry Pickett plant, Northville, Michigan. An important unit in this installation is a Simplicity 6' x 20' Horizontal Screen, one of the biggest of its type in operation today. This installation features a divided screen with ¾ of the deck carrying clean, concentrated gravel while the tailings move over the other ¼. Screen action and a secondary spray system assures positive media recovery over the 20' travel. Get complete information on Simplicity screens and other equipment by contacting your nearest Simplicity sales representative or write us in Durand, Michigan.



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SIEVE		PERCENT BY WEIGHT	
Passing	Retained On	Minimum	Maximum
No.	No.		
-	4	0	5
4	8	5	15
8	16	10	20
16	30	20	30
30	50	20	30
50	100	12	22
100	—	5	10

The fineness modulus in such cases must be between 2.30 and 2.80 and nine samples of every ten must have fineness moduli within 0.10 of the average of all previous samples.

Coarse aggregate will be required to be separated into size groups with gradings as follows:

SIEVE	PERCENT BY WEIGHT PASSING			
	No. 4	⅜	1½ in.	3 in.
	- ⅜ in.	- 1½ in.	- 3 in.	- 6 in.
7 in.				100
6				90-100
4			100	20-45
3			90-100	0-15
2		100	20-55	0-5
1½		90-100	0-10	
1	100	20-45	0-5	
⅜	90-100	0-10		
⅜	30-55	0-5		
No. 4	0-5			

Coarse aggregate is required to contain not more than 25 percent of flat and elongated particles in any size group. A flat particle is one having a width to thickness ratio greater than 3; an elongated particle is one having a length to width ratio greater than 3.

The activities of the Concrete Division of the Waterways Experiment Station in its capacity as Division Concrete Laboratory for the Lower Mississippi Valley Division are coordinated with those of the other Corps of Engineers concrete laboratories. All tests whether on aggregates, concrete, or other materials are conducted according to the procedures standardized and published in the Handbook for Concrete and Cement. The Handbook is kept up-to-date by the Waterways Experiment Station as one of its projects in the Civil Works Investigations Program. First published in 1949 it now contains 173 items. Each item is reviewed by all concrete laboratories and approved by the Office, Chief of Engineers, before it is published. Distributions of supplements and revisions are made quarterly. The policies used are those of the Standard Practice referred to above. Duplication of work on aggregates is avoided by reference to the Compilation of Aggregate Test Data described previously.

It is believed that this review will indicate the policies and procedures used in connection with aggregates in the Lower Mississippi Valley by the Corps of Engineers — will indicate the degree to which the Waterways Experiment Station participates in this work, and, it is hoped will suggest that they are indicative of a rational approach to a problem which results in better concrete at lower cost to the public.

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- *Low maintenance* is another great Cedarapids advantage! Exclusive life-seal bearings on all troughing and return rolls, self-aligning bearings throughout, disc clutches, stress relieved screen box, free use of alloy steel, easy access for lubrication and service adjustments.

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A Cedarapids Portable Primary ahead of your Cedrapids-Symons Cone Crusher Plant increases production still more, especially in quarry operations. The big Cedarapids 3240 Portable Primary will crush from 150 to 300 tons of big quarry rock. The jaw crusher, with 1280 sq. in. jaw opening, will take rock up to 32" x 40" in size and quickly reduce it to 6" feed for the Symons Cone. Cedarapids Jaw Crusher Primaries are available in sizes from 15" x 24" to 32" x 40". Cedarapids Portable Primaries are also available with Double Impeller Impact Breakers for many quarry conditions.

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Cedarapids Secondary Plants are low-cost, portable gravel and rock crushing and screening plants, complete in themselves, which may be used alone or behind a portable primary, depending on conditions, for big-volume production of finer-sized aggregates. Since the finished product size is determined by the crusher in the secondary, four types of crushers . . . Hammermill, Roll, Twin-Jaw or Symons Cone . . . are available.

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ROTARY KILN Its Performance and Development

• First of a series of articles on present rotary kiln performance, the reasons for its deficiencies, and suggested methods for their correction. The series will be based on a comprehensive paper presented before the National Lime Association

By VICTOR J. AZBE*

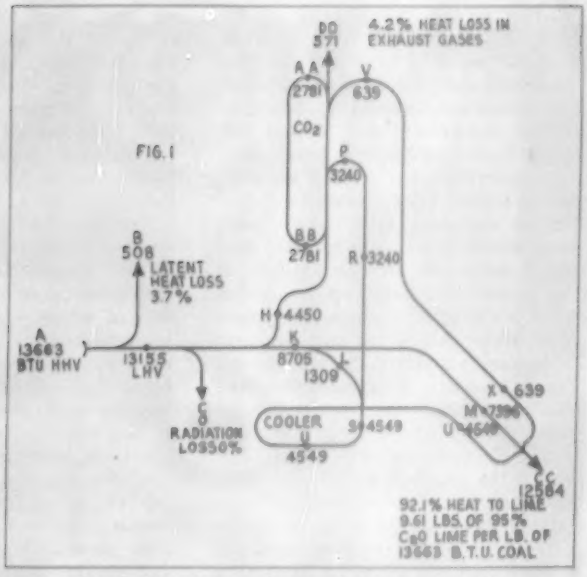


Fig. 1: Heat balance diagram for ideal rotary kiln

IT IS THE PURPOSE OF THE WRITER to discuss current performance of rotary kilns, the reasons for their deficiencies and the manner in which they may be corrected. Among the subjects covered will be the general technical considerations, systems of evaluation, and achievement possibilities through the more ordinary approaches of improvement but with all of this leading toward the ultimate, the complete correlated rationalization as covered by the Azbe rotary kiln patent.

On the surface it appears that the rotary should be a very convenient and desirable unit to have as it will calcine small stone, often wasted, in rather considerable amounts at the lowest possible rate of labor demand. This is true, but not of the ordinary rotary kiln such as virtually all those now in operation.

The rotary kiln is subject to many handicaps which greatly minimize and frequently completely defeat its inherent advantages. Thus, while it does calcine material from sludge to 2½-in. stone, it is possible only within very narrow size ranges, and even then undue kiln retention is required if lime of high CaO availability is to be produced.

High kiln capacities are obtained, but these are not really high when compared to the great size of some of the kilns and to the tremendous collective surface area of the stone therein.

Fuel efficiency in general is quite low, almost without exception. While the theoretically possible maximum ratio for an ideal kiln, as demonstrated by Fig. 1, is 9.61 lb. of lime per pound of high-grade coal, actually only from 2 to 4 lb. are obtained. Far more fuel is wasted than used and the reasons therefore, while apparent, are not fully recognized and understood.

Heat transfer in a rotary kiln is almost exclusively by radiation. However, the bed is subject to particle size segregation and therefore to very poor mixing. It is of low heat absorbing power and very high flame temperatures are the natural undesirable result, but they are necessary due to the conditions. This brings on bothersome ring formations and refractory troubles and may result in overburned lime even though other sizes of the same may still contain residual core.

There is also the dust problem. The larger the diameter and the longer the kiln, the more attrition material there is, the finer particles of which constitute a dust that under certain atmospheric conditions is particularly adhering and worse than most dust.

In the case of cement clinker, magnesitic or dolomitic sinter operations, conditions are even less satisfactory and more difficult to correct. For process reasons, these materials do require high, intensive temperatures, a lime kiln does not. What the lime kiln requires is exposure of its surfaces which, if accomplished, would dissipate most of its faults.

There have been attempts to improve the rotary kiln ever since its beginning, but these were not of the right order, or sufficiently far reaching. However, if the matter was followed through, then the various objections would be overcome, or at least greatly minimized and the rotary kiln would become an acceptable unit for general use. It must be stated though that the development must be general, not just some single pet feature. If the rotary kiln improvements are not carried out through the entire system, there may be little or no improvement. This is because, in the case of a rotary kiln, gains accomplished at one point have a curious way of getting lost at others. It is quite possible to have a good stone preheating or a good recuperative lime cooling system individually, and still have a poor performing, low capacity, low thermal efficiency kiln and an increase in operating complications.

Thermal Efficiency of Rotary Kilns

At times, it seems that rather than improve a rotary kiln partially, it would be better not to improve it at all, leave it a simple kiln completely unencumbered and drive it at the very utmost of capacity. We do not seriously favor this; it is meant only as a reason for complete rationalization in respect to all pertinent phases of thermal efficiency, capacity, operating reliability, etc., which has never been done because the rotary kiln has never been completely understood. Something was known about its two ends but little specific about the imperfections of its middle portion. So the middle section of rotary kilns was increased, while the argument throughout this paper will be for an even shorter section. Not only argument, but we propose to prove our point.

The reason we do not make further

*Pres. Azbe Corporation, St. Louis, Mo.

progress in the improvement of the rotary kiln is because most of those who are involved have not acquired the knowledge to reason quantitatively, through not knowing the losses, or if these are known, they are not able to put them in the proper perspective.

Concerns employ trained accountants to trace every fraction of a dollar, but in operating kilns where large sums are involved, there are no "thermal accountants" and there is little of the deeper understanding and therefore only a feeble, ineffectual improvement effort. All of the energies seem to become exhausted in "keeping going." There is little of the higher aim, except by a few exceptional individuals.

The formulation of a "Heat Balance," the required testing, the many calculations and subsequent interpretations of it constitute a procedure far from simple, requiring specially trained men having an understanding and, in addition, a sincere interest.

It was not simple for the writer, and like everyone else, he also interpreted the results wrongly, and it is only in the more recent years that he developed a simplified approach, which may not be quite as accurate but it certainly is far more revealing. It is not that we do not want accurate and as complete heat balances as possible, we need them to study the deeper mysteries. It is that a fairly good approximate idea, readily formulated and manipulated, which is convenient to toy with, is better than one too complete and involved that it will discourage the attempts at its compilation and later probably still leave one in the dark.

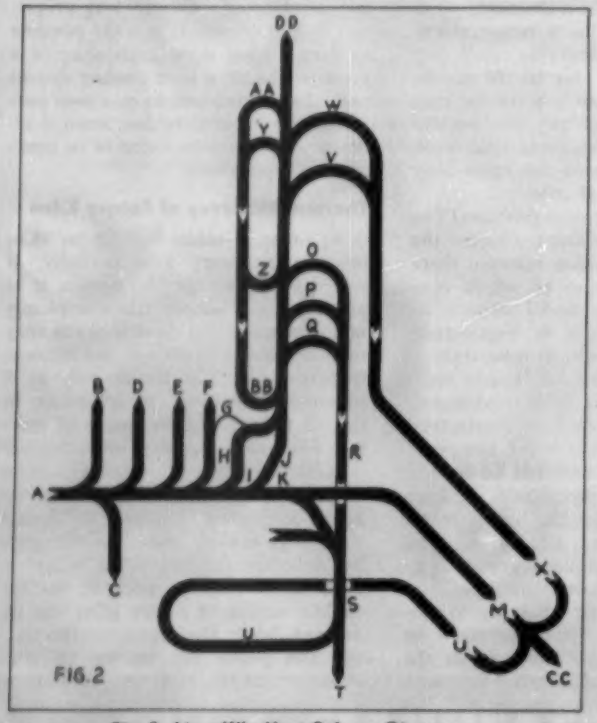
We shall deal in the more complex and the simple. It will be found that we are mainly concerned with three major sources of waste, the determination of which is so simple that with some practice a shortened heat balance may be formed with only a few calculations. It may even be sensed, as a doctor often senses the well being of a patient by a glance and a few questions. When one is capable of this, then the kiln ceases to be a thermal mystery and quantitative reasoning becomes possible. This manner of rotary kiln performance evaluation is not conventional, neither is the manner of our rotary kiln structural systematization. They have been developed together and are part of each other. One reveals the possibilities, the other leads to their realization.

In the formulation of the complete rotary kiln heat balance, all heat flow streams, such as the sensible heat of escaping dust and, of course its chemically entrapped heat, which involves analysis of the dust, must be considered and taken into account. This is demonstrated by the diagram in Fig. 2 and its attendant tabulation. Next are the equally important losses such as those due to the excess air and incomplete combustion, — their actual determination being far from a simple matter. In operation these are given considerable attention and most likely are being limited through burner manipulation and combustion control. However, when these losses have been reduced to the minimum, in the whole, there still does not seem to be much, if any, improvement and the rotary kiln still remains discouragingly inefficient.

This is because the three major losses which really determine rotary kiln performance are strangely given the least attention, it being assumed that in the main they are inevitable. These are: (1) the loss due to radiation and convection of heat from the kiln structures; (2) the loss due to the calcining zone terminal temperature differential; (3) the loss due to nonrecuperative cooling of lime, clinker or whatever it may be. Unless these three are substantially limited, no effort at improvement will show results of any great degree of magnitude.

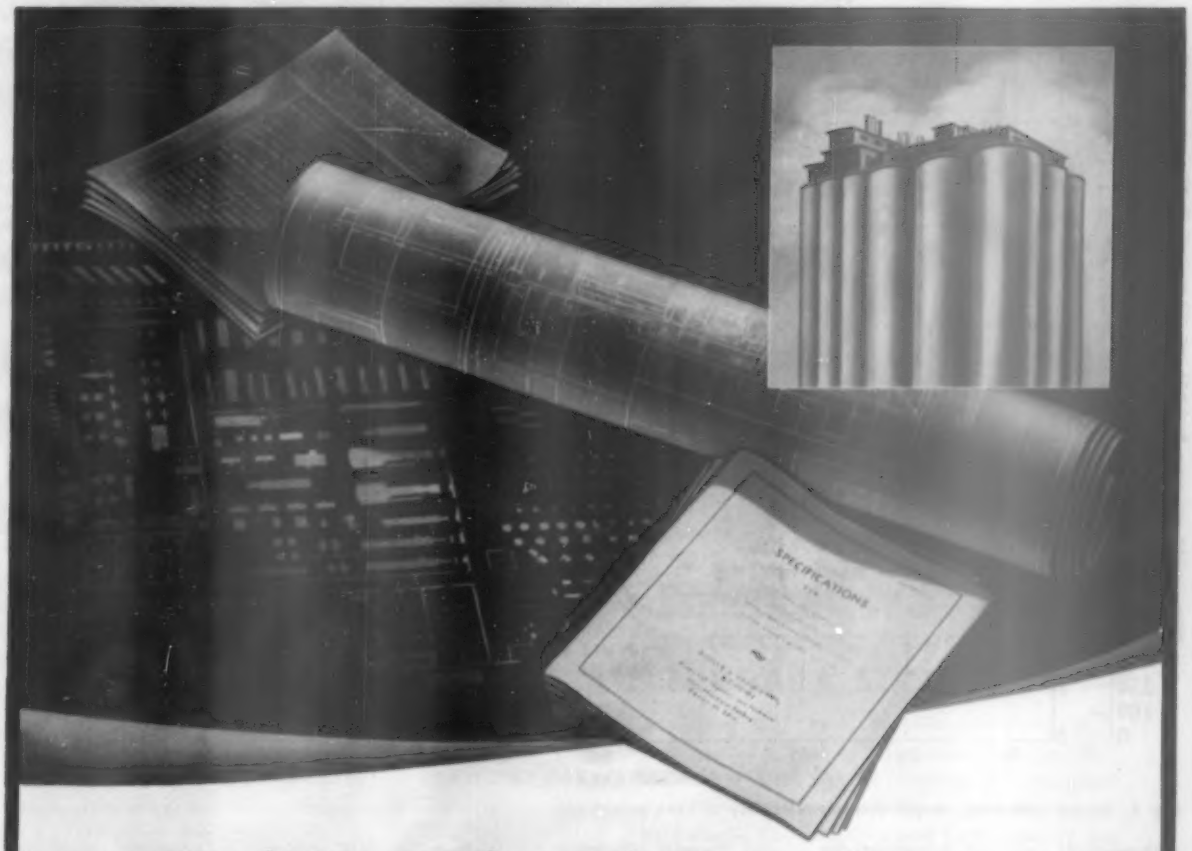
It will be noted that in the above the stack loss is ignored. This is because

A. Heat input basis of high heat value
B. Latent heat of H_2O from combustion of hydrogen
C. Radiation heat loss from all zones of kiln
D. Sensible heat loss due to excess air



E. Dust — sensible heat and heat of recarbonation
F. Incomplete combustion undeveloped heat of CO, H_2, CH_4, etc.
G. Developed heat of CO
H. Heat of products of combustion at 1525 deg. F. (low heat value)
I. Heat of products of combustion above 1525 deg. F. (high heat value)
J. Calcining zone heat loss due terminal temperature above 1525 deg. F.
K. Heat of combustion available to calcination reaction and lime superheating
L. Sensible heat of lime superheat
M. Net of high temperature level heat to calcination reaction
N. Heat of exothermic combinations
O. Sensible heat in MgO portion of preheated stone at 1525 deg. F.
P. Sensible heat in CaO portion of preheated stone at 1525 deg. F.
Q. Sensible heat in extraneous matter of preheated stone at 1525 deg. F.
R. Total sensible heat of lime at 1525 deg. F.
S. Total sensible heat of lime leaving kiln at superheat temperature
T. Sensible heat of lime lost through nonrecuperative cooling
U. Sensible heat regained through recuperative cooling (available to reaction)
V. Heat to calcination reaction due to reaction differential at high temperature)
W. Heat regained through preheating of fuel with low level heat
X. To heat of calcination reaction from V-W (low level heat)
Y. Sensible heat of preheating CO_2 component of $MgCO_3$ in stone
Z. Sensible heat of CO_2 from $MgCO_3$ to exhaust
AA. Sensible heat of preheating CO_2 component of $CaCO_3$ in stone
BB. Sensible heat of CO_2 from $CaCO_3$ to exhaust
CC. Total heat applied in calcining reaction
DD. Total of sensible heat loss in products of combustion and CO_2 from stone

Fig. 2: Lime Kiln Heat Balance Diagram:



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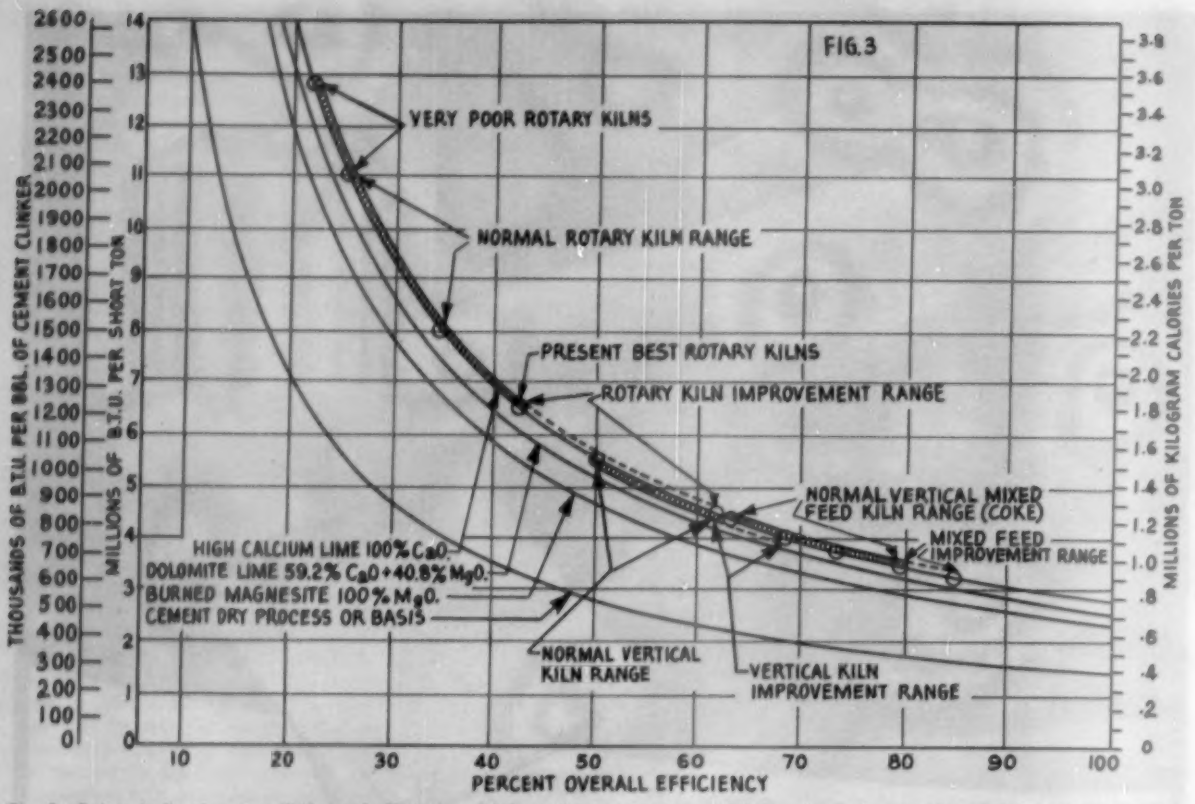

Fig. 3: Curves indicating overall thermal efficiency of kilns calcining two types of lime, a burned magnesite, and dry process cement

if these three losses are minimized the stack loss will be minimized, and if they are not, the stack loss will remain high in spite of anything that is done.

If we take into consideration the great amount of collective stone surface in the rotary kiln, the rather rapid calcining rate of such small stone, and the very high temperature prevailing, we find that the performance of even the best of rotary kilns is low. Some may perform well, even twice as well, but only in relation to some other kiln. Twice as good is still not good and is even poor when measured with the proper sort of yardstick.

Adequate amounts of heat are generated, but this heat is mainly wasted before it can be absorbed. The surface, although present, is not available for heat transfer, the gaseous and solid streams do not contact, some of the stone never comes in sight. Heat transfer takes place almost solely by radiation and it is only a limited amount of the total heat that may be so transferred. Most of the radiant effect is developed where there is least absorptive power and heat radiated to nonrecuperative surfaces of the kiln front, or over into the preheating section of the kiln, is wasted as much as if it had been wasted through the kiln shell.

Fig. 3 indicates by a series of curves the relationship between heat required and thermal efficiency for high calcium, dolomitic and magnesitic lime, and also cement clinker. In the case of lime, it is based on 100 percent of the respective oxide.

It will be noted that for rotary kilns about the best is 42 percent thermal efficiency, a heat requirement of 6.5 million per ton of CaO, but occasionally thermal efficiency is hardly more than 20 percent.The more normal rotary kiln performance range is between 35 and 25 percent thermal efficiency from 8 to 11 million B.t.u. For years in some plants, attempts were made to budge out of this range without much success and, after many years, the reason why they have not succeeded is not known.

Considering the recuperative possibilities there are in lime preheating air, of stone cooling the gases, of counter flow entirely lacking in the case of open hearth furnaces, the glass tank, and only partially existing in case of the blast furnace, we dare say that the rotary kiln has the lowest functional capacity and lowest thermal efficiency of any of the major heat transfer units now extant.

By comparison, the best of gas fired kilns operate now at close to 4 million and the best of mixed feed kilns at 3.5 million B.t.u. By various means all of these kilns could be improved further as shown, but the greatest improvement possible could be made with the rotary kiln. To get it to 6 million is readily possible, then to 5, and eventually to 60 percent efficiency or 4.5 million B.t.u.

This is not wild guessing, it can be done and it will be done, but first we must overcome the current fatalistic acceptance of the wasteful conditions, then attack the aforementioned three major losses.

Evaluation of a Kiln Heat Loss

In the author's long series of articles dealing with the rotary kiln appearing in ROCK PRODUCTS during most of 1951, he developed the fact that any high temperature level heat loss is accompanied by a certain definite amount of low level heat loss. That is, any loss of calcining heat, as by radiation from the kiln shell which results in lessened lime production, results also in higher exhaust temperature and heat loss due to reduction in the flow of stone and its cooling effect on the exhaust gases.

The high level heat loss is all sensible heat of the lime discharging from the kiln; all of the heat of excess air leaving the calcining zone at its terminal temperature; all of the heat in the normal gases leaving the calcining zone above 1500 deg. F.; all of the heat lost by radiation from any part of the rotary kiln at temperatures of

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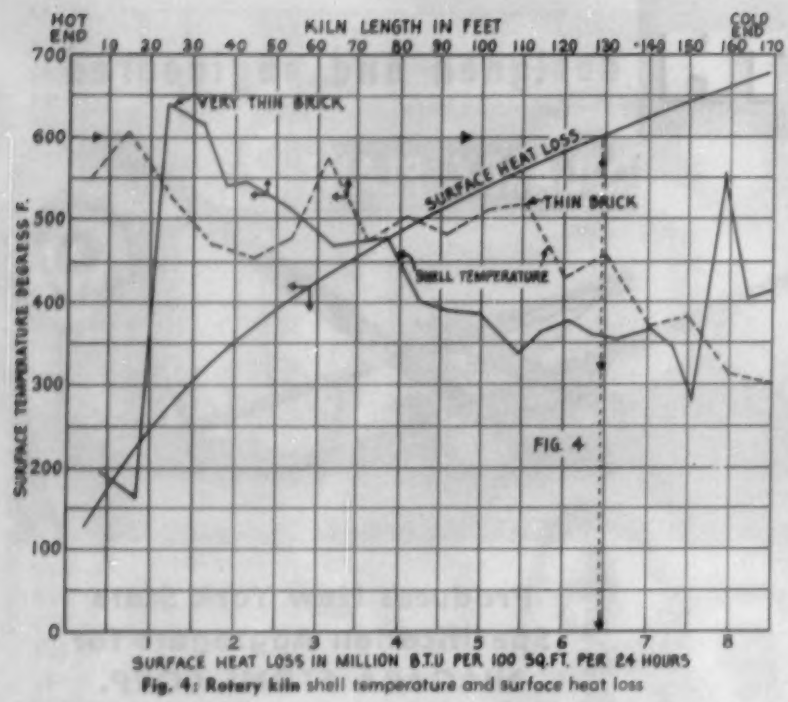

Fig. 4: Rotary kiln shell temperature and surface heat loss

over 1500 deg. F.; and all of the heat lost from the cooler, the mill and any other part of the discharging end of the system.

The ratio of high temperature level heat loss to low temperature level loss is for high grade coal and high calcium lime in the ratio of 71.5 high to 25.5 low. In view of this, any determined high level heat loss must be multiplied by 1.4 to give the true loss due to the initial high level loss. For example, if the direct loss due to nonrecuperative cooling of lime is 1310 B.t.u. per pound of coal fired, the corresponding stack loss is 520 B.t.u. for a total of 1830 B.t.u.

The 520 B.t.u. is lost at the stack, but it is still a cooler loss since nonrecuperative cooling is responsible for this loss. Assuming that the coal has a heat value of 13,919 B.t.u. then the loss "Basis of Heat Input" is not $\frac{1310}{13,919} \times 100 = 9.4$ percent but rather $\frac{1830}{13,919} \times 100 = 13.2$ percent. Then furthermore, assuming that this is a kiln operating at 10 million B.t.u. per ton of lime, the lime to fuel ratio is 2.78 — 1. Since 1310 B.t.u. are required per pound of 95 percent lime produced, dividing 830 by 1310, reveals that in lime production the loss due to nonrecuperative cooling was 1.39 lb. of lime or $\frac{1.39}{2.78} \times 100 = 50$ percent.

Thus, the loss is not the relatively minor appearing amount of 9.4 percent, which a conventional heat balance would show, or the higher figure of 13.2 percent, the actual amount lost due to nonrecuperative cooling. "Basis Of Production" is the startling figure of 50 percent.

No cooler has ever improved a kiln 50 percent, but that is because the heat saved is then lost in other ways. If that also had been avoided, as it could, then this would have been the gain. It is for this reason that we argue that the improvement must be clear across the board or there will be little or even no improvement.

This manner of evaluation of a loss, "Basis Of Production" rather than "Basis Of Heat Input" may be the best we have developed in lime. It startles a person, and we need to be startled to move off the dead center.

Evaluating in this manner makes development seem far more worthwhile, but this development must be correlated for the reduction of all of the losses. This correlation as an all embracing system, is the basis of the Azbe rotary kiln patent.

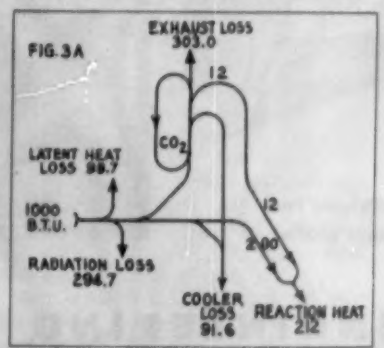

Fig. 3-A: Simplified heat balance under actual conditions. Lime 0.154 lb. per 1000 B.t.u. and 12,987 cu. ft. gas per ton CaO

Radiation—Convection Heat Loss

The reason why the rotary kiln at the apex of inefficiency is so poor, as shown in Fig. 3, is because the kiln radiation loss in lime equivalent was far more than that of lime produced. It must have been this as combustion was perfect, excess air at a minimum and the exhaust gas due to the low capacity was relatively cool.

The kiln was 9- x 160-ft. in size, but production was only about 100 tons of lime per day. Heat consumption was 12.8 million B.t.u. per ton. Load was very light, lime discharged was very hot, but exhaust was only about 1200 deg. F. average, with the lower discharging stream 905 deg. F. and the upper 1290 deg. F., the great difference indicating severe gaseous stratification.

If the kiln load had been slightly increased, to increase the heat absorbing surface, and if production had been increased to 200 tons, radiation loss would have remained approximately constant and heat consumption would then have been 8.8 million B.t.u. per ton rather than 12.8 million. This 8.8 million is just what one would have expected from a simple kiln of such size without a cooler and preheater, operating at 200 tons.

A simple heat balance was calculated. This is not difficult. All that one needs to know is the correct exhaust gas analysis and the correct mean exhaust temperature from which the stack loss is determined. The quantity of lime produced and its discharge temperature establishes the loss at discharge. Latent heat loss is characteristic of the fuel, which in this case was natural gas and is known; so is the heat of calcination reaction, calculated from the amount of lime produced. The remainder is the radiation and convection loss from the kiln structure as a whole. The balance follows:

Heat of calcination (efficiency)	21.2
Loss due to latent heat of water vapor	9.9
Loss due to sensible heat in exhaust	30.3
Loss due to nonrecuperative cooling of lime	9.2
Loss due to radiation and convection	29.4
	100.0

The high radiation loss (Fig. 3A) is absolutely startling, but nothing else could have been expected from a kiln of this size, operated with very light kiln load and at such low capacity.

(Continued on page 109)

New Conveyor Belt Combines Increased Strength With Extra Flexibility

Rugged Mainliner - Conveyking conveyor belt is engineered for tough jobs involving high tensions, high lifts and long center distances. It's ideal for conveying aggregates, coal and ores. It's steel-like in strength, practically stretchless, yet extremely flexible and troughs easily.

Mainliner belts have about twice the strength of ordinary cotton duck belts of the same gauge. They resist the destructive action of water, oil, weather and age. Why? Because these belts are made of multiple plies of strong duck with Nylon woven across the width and a new-process, high-strength cotton woven lengthwise, with skim coats between plies. They are available in any lengths, with any number of plies, in widths up to 72".

Like other heavy duty belts, these Mainliner Conveyking belts are custom made to meet particular requirements of individual jobs. They can be made with a cover tensile strength of 3500 to 4000 pounds average and a friction pull of 20 to 24 pounds average. They can also be made with a cover tensile strength of 2500 to 3000 pounds and a friction pull of 16 to 19 pounds. They are also available in oil-resistant Neoprene. All are mildew inhibited throughout. A breaker strip can be included in top cover, if specified.

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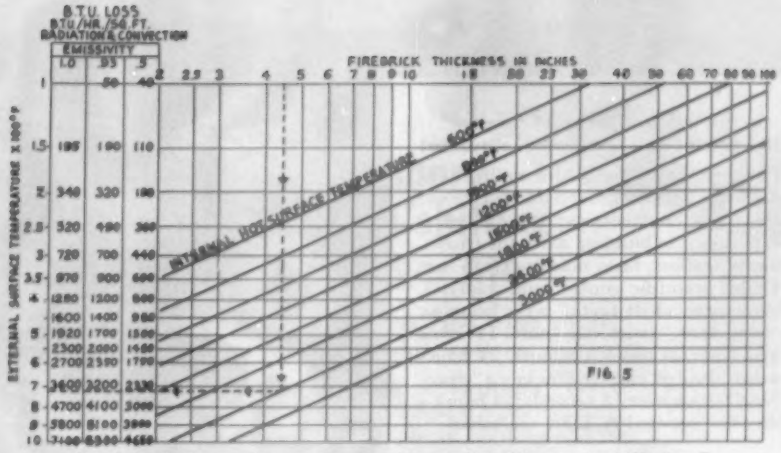

Fig. 5: Radiation and convection loss from wall surface to air at 70 deg. F

Kiln load is, of course, a factor as revealed by the assumption that if there was no kiln load, no lime would be made, about half the heat would have been lost by radiation and about half up the stack; the simplest heat balance yet. The kiln would have been a sort of a stovepipe which all kilns now are in a variable extent.

The high radiation loss indicated is actually even worse because it carries the blame for some of the exhaust loss. Due to heat loss by radiation, less lime was made and so less stone was coming down through the preheating zone to cool the upgoing gas stream. Taking this into account, the radiation loss was 35.1 percent, "Basis of Heat Input," and 162 percent, "Basis of Production." One hundred tons of lime were made; 162 tons of lime were wasted directly or indirectly by radiation, of which half could be saved, and through special efforts, three-fourths could have been saved.

Fig. 4 shows the shell temperature of two kilns and what the attendant direct radiation heat loss would have been. Where shell temperature was 600 deg. F. it was 6.5 million B.t.u. per 100 sq. ft. of shell area per 24 hr. Where shell temperature was 300 deg. F. the loss was only 1.5 million. This is important to remember; the loss is not proportional to the surface temperature, it increases very rapidly as the brick thins out, or when internal kiln temperature rises.

However, it is believed that the radiation loss is always more than the figure arrived at by surface temperature measurements. The rotary kilns are usually exposed and weather has an effect on them, or they are in high buildings or subject to strong convection currents. It also takes a rather conscientious person to take the surface temperature correctly. Besides, there are radiation losses from the kiln front, the cooler, the mill, the hot air and fuel piping. There are also internal lengthwise radiations, from the hot zone to the hood, and also into the preheating zone. Basing this loss in heat, the balance in kiln surface temperature leaves too much heat unaccounted for which is believed to be mostly that lost by radiation. Therefore, the loss is based on internal temperature and wall conductance. Considering all these factors, Fig. 5 indicates a more reliable method.

A more normal example would be that of a 9- x 175-ft. kiln, having a heavier, deeper load, and of more peripheral heat absorbing area. Such a kiln in cross section, drawn to scale, would be similar to Fig. 6. A mere glance at this illustration reveals that there is more chance for heat loss by radiation than there is for heat absorption by the lime. At least this would be true in the hot zone. There is a tremendous shell-heat radiating area and only a limited lime-heat absorbing area. The heat radiating shell area is insulated by only about 4½-in. or 5-in. of brick of good conductivity, while the center of the bed, where the core is, also is even more insulated with rather poor heat-conducting lime, which is heated close to the flame temperature.

Such a kiln is likely to be operated at a temperature ranging from 3000 deg. F., down to 1500 deg. F. at a logarithmetic mean temperature of 2162 deg. F. With 4½-in. unencrusted lining, the shell loss would be, according to the chart in Fig. 5, about 1920 B.t.u./sq. ft./hr. As the gases are escaping from the kiln at a temperature corresponding to that of the incipient calcination, all heat lost by radiation is of high temperature elevation, to which the companion stack loss must be added for a total of 2688 B.t.u./sq. ft./hr. This heat waste is equal to a loss in production of about 120 tons of lime, regardless of whether the kiln is producing 120 tons or 240 tons of lime. This is high, but it can be more and it seldom is much less.

Stating that radiation loss varies inversely to kiln capacity may be an over-simplification. There are many factors that affect it, some making this

(Continued on page 122)

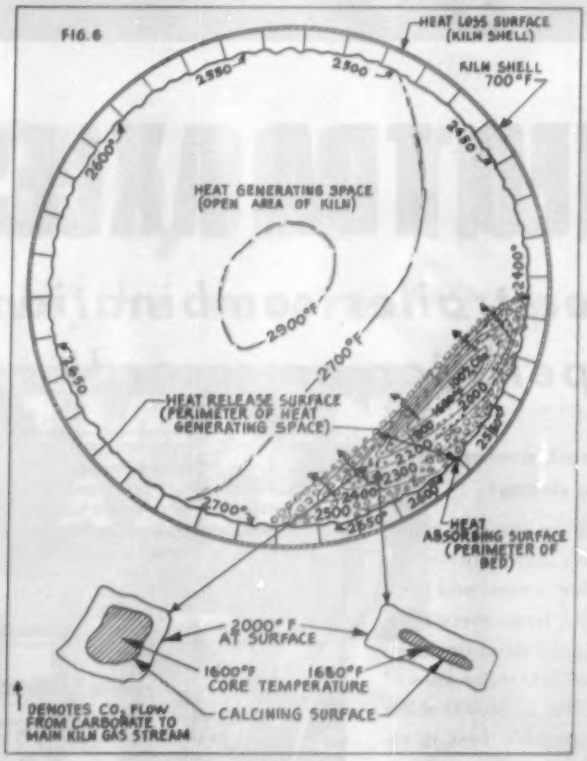

Fig. 6: Kiln hot zone temperature differentials

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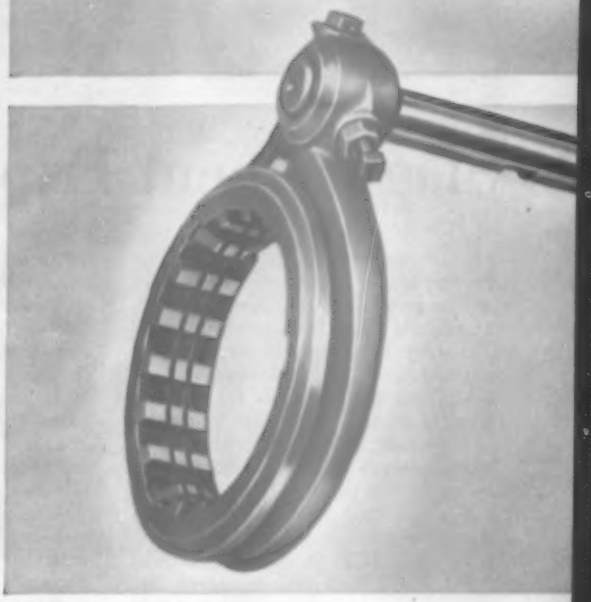

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Engineers of the French Department of Public Works using mobile sonic unit on NATO airfield concrete runway to test for below-surface fissures

• N.A.T.O. airfields, railroad and highway construction in France have put slag cements to severe tests. Experience indicates that cements are resistant to acids and corrosive agents. Care must be exercised in curing as these cements harden slower than portland cement

By GAULT MacGOWAN*

Slag Cement Experience In France

IN FORMER YEARS blast furnace slag was piled up around the steel plants of Europe in miniature Alps of waste. Today, the slag is being converted into a component of cement for commercial use in N. A. T. O. construction works, the new airfields for the defense of Europe and general purposes.

It is also used, as elsewhere, for highway and railroad construction aggregates. Slag cements have been used extensively for suitable projects in Europe for the past 20 years, along with the ordinary portland cement familiar to American engineers, but their use in the construction of airfield runways and other pavements had practically never been done in France before the N.A.T.O. construction program began.

On several projects the results were excellent. In others fissures started or surface powdering occurred locally in the slabs. It was easy for the contractor to blame it on the cement and to request that the use of slag cements be prohibited. The cement manufacturers saw no reason to accept the contractors' complaints as justified. Inclusion of slag into the cement had been fostered for the following reasons:

1. Basic slag, with inherent cementing properties, is available in all steel factories using Lorraine iron ore.

2. A smaller capital investment is required to expand a slag cement mill than to expand a portland cement plant.

Slag cement plants only require grinding mills but manufacture of portland cement requires kilns.

3. Consumption of coal for the manufacture of cement from slag is 100 lb. per ton whereas it is more than 600 lb. per ton for portland cement. As long as coal is scarce and costly in Europe, the use of slag is economically advantageous.

Concrete made of slag cement containing no free lime had been proved in the past to be more resistant to acids and corrosive agents. On the other hand, hardening was somewhat slower than portland cement, and special care was advised during the curing period.

It therefore had always been considered sensible to use slag cement for work in contact with aggressive waters or soils, and portland cement for reinforced concrete or pavements which are exposed to rapid drying. Such were the text book procedures when the main N.A.T.O. construction program began.

Four Basic Types

A number of projects happened to be located in eastern France, in the Lorraine steel mills area, right in the center of slag cement production. Had portland cement been specified for all projects, the cement would have had long hauls from other centers to the sites. As cements with varying proportions of slag were available near the sites, the local authorities therefore authorized their use. They all contain some portland cement.

The proportions of slag in the various cements were as follows:

Iron cement (ciment de fer) approximately 30 percent slag.

Mixed "metal" cement (metallurgique mixte) approximately 50 percent.

Blast furnace cement (ciment de haute fourneau) approximately 70 percent.

Slag clinker cement (ciment de laitier au clinker) approximately 85 percent slag.

The remaining percentage in each case is portland cement.

To answer the complaints of contractors, a board was set-up on which were represented the Air Base technical services, the Ministries of Public Works, of Commerce and Industries, the Secretariat General of National Defense, the Public Highways, Cement research and contractors' laboratories and representatives of the contractors and the cement manufacturers.

Never, perhaps, had so many high level brains been assembled to study the contents of the cement sack. Different tests were started. A party was sent out to the various airfields with a special testing device for measuring the superficial hardness of the concrete. The device used was an ordinary boring tool, with a tungsten steel bit, working under a constant vertical

*Universal Trade Press, New York, N. Y.

Armand Mayer, chairman, French Cement Research Institute

Thermoid Conveyor Belting cuts handling costs in quarries

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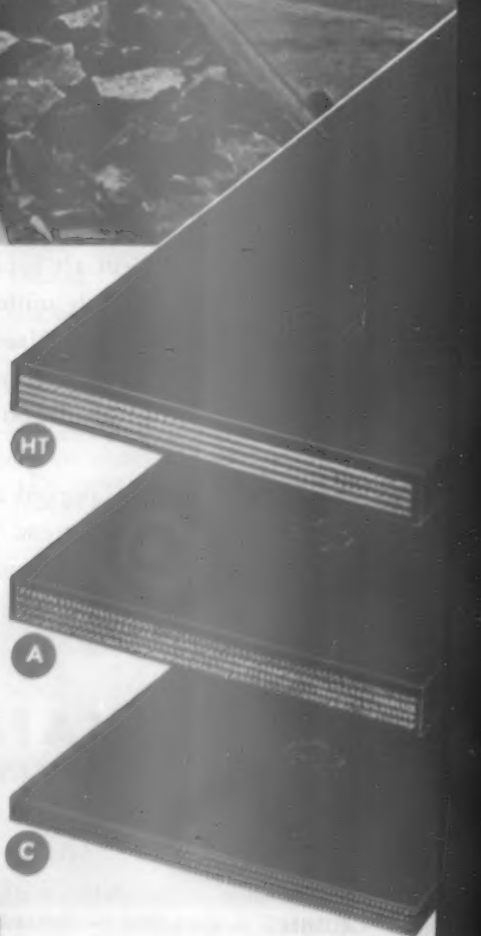

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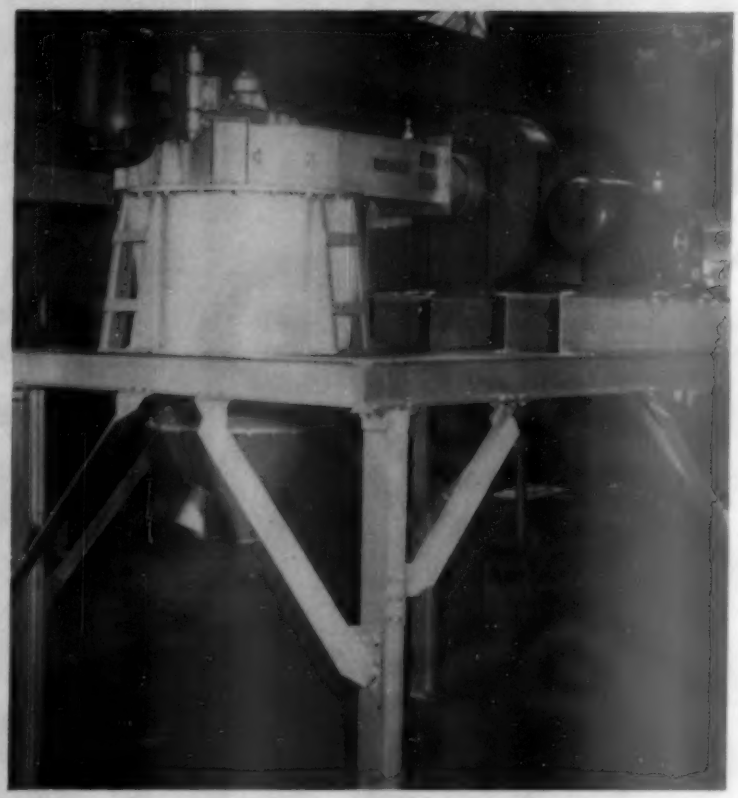

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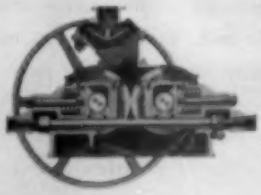

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load, and it was hand-revolved. After a given number of revolutions a gauge was cut in the concrete. A print of the specimen was then made with plaster of Paris and brought to the laboratory. The depth of the cut was a measure of the resistance to wear of the concrete.

Other tests were made following an offer by a cement company to construct a number of slabs in the plant's yard, submit them to the heavy truck traffic to and from the plant, using different qualities of cement and different admixtures and compare the results.

The challenge was accepted. The slabs were built and although the surfacing was made with tools simpler than normal construction equipment, the results were very instructive. When properly cured, the surfaces obtained with the slag cement were as good as those with portland cement.

The board was thus able to issue a unanimous report. The conclusion was: "All incidents noted appear imputable to the lack of due precautions in the use of slag cements." This report was finally published last November. Long before, in 1951, the first faint rumblings of American engineering discontent with the French concrete had leaked out. But it was not until 1952, that the cement manufacturers discovered that the trouble was being pinned on them.

There were two phases of American concern in this matter. First, American technicians were employed only as observers of airport construction. The fields were constructed by the nationals concerned for the use of their own and Allied fliers. Americans had no control in setting up specifications, nor had they the right of objection.

U. S. Construction

The second category of construction is built with American funds for the purpose of the U. S. Air Force in Europe. This work is specified and supervised by U. S. engineers. The actual work is done by French contractors.

Sonic testing engineer operating instruments in mobile laboratory

Quenching molten slag which is the raw material used in so-called slag cements

The specifications are drawn up by the Joint Construction Agency of the Army, Navy and Air Force in the European command. For all these works portland cement is specified. As U. S. tax dollars are involved under the off-shore purchase program, the question has arisen whether this specification is strictly necessary in view of the lesser cost of slag cement.

French specialists contend that experience in America with portland cement — slag only being used, if at all, for lightweight aggregates — is no basis for rejection of European slag cements. Cementing properties only exist in slags containing at least 45 percent lime, and they must be properly processed.

Manufacturing Process

The process consists in flowing the molten slag into a large mass of water so that it cools quickly and remains in an amorphous unstable state of equilibrium. A suitable catalyser then causes the slag to crystalize and it is then a cementing agent.

When the amorphous slag is ground in the plant, a raise in temperature and pressure, or an electric current, are sufficient as catalysers. A small proportion of portland cement achieves the same result.

The slag looks like coarse sand and will remain for months without setting. As it contains no free lime, slag cement was recommended by the French research technicians, as superior to pure portland cement for construction of sewers and works in sea or brackish water. Guarantees of longevity and indestructibility far greater than portland cement are claimed for it.

According to Armand Mayer, chairman of the French Cement Research Institute, the use of slag cements in N.A.T.O. airfield construction has now been restricted to iron cement, 30 percent slag; and mixed metal cement, 50 percent slag. But to avoid any future trouble, results are now very strictly controlled and continually checked.

Use Sonic Tests

Apart from the routine compression and tensile tests made in the regular field laboratories, three mobile sonic testing units are almost constantly on the different projects to check on the spot the quality of the concrete.

The sonic tests enable a complete check of the whole surface of a pave-

(Continued on page 122)

Granulated slag *raw material which is ground and mixed with portland cement in proportions ranging from 30 to 80 percent to make different types of slag-portland cement*


now!
For years, smart mill operators have been cutting grinding costs by using ABK Metal Castings for such items as mill liners, rolls and pump parts. Highly resistant to abrasion, ABK Metal usually gives 3 to 4 times the service life associated with other "abrasion-resistant" metals. NOW, FOR THE FIRST TIME, YOU CAN BUY GRINDING BALLS MADE OF THIS SAME ABK METAL!

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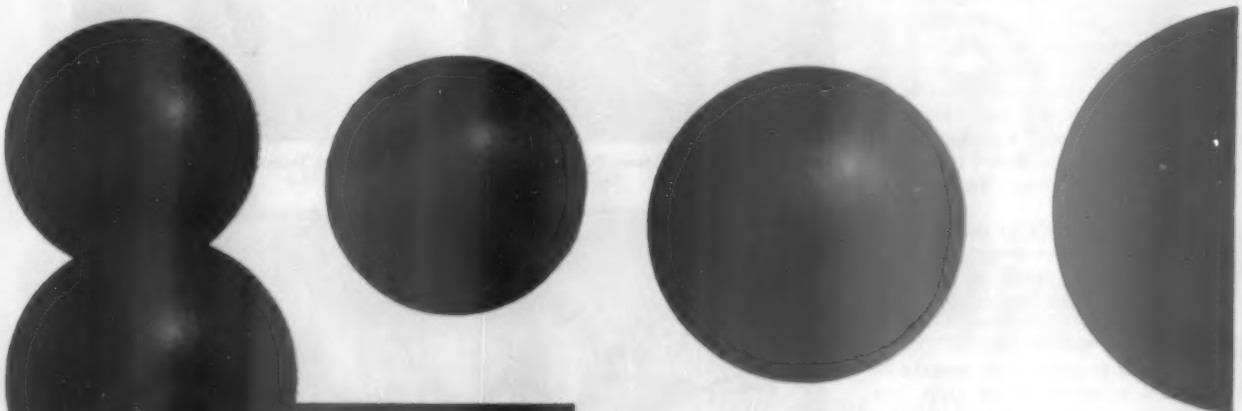
To meet the demand for a better, abrasion-resistant grinding medium, the American Brake Shoe Company is now producing ABK Metal Balls.

These nickel-chrome iron balls feature the controlled structure of ABK Metal—a Brake Shoe exclusive. As in the case of ABK Castings that are widely used in grinding, the hardness of ABK Grinding Balls will range from 500 to 700 Brinell. Further, ABK Metal's controlled structure enables it to last up to 3 or 4 times as long as so-called "abrasion-resistant" steels of the same rated hardness.

ABK Metal Grinding Balls are regularly produced in diameters from $\frac{5}{8}$" to 2". Other sizes upon request. For full information on how ABK Grinding Balls can help you reduce your grinding costs, contact your nearest American Brake Shoe representative.



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Left to right: Hon. Geo. Christopher, Congressman, Missouri 4th District; Arthur R. Alvis, president of the Missouri Limestone Producers Association, Butler; and Sam D. Shirky, associate dean, Missouri College of Agriculture, Columbia

• **Missouri Limestone Producers Association annual meeting held immediately before Soil Fertility and Plant Nutrition Council of Missouri Short Course at Columbia, Mo.**

Missouri Agstone Meeting

THE ANNUAL MEETING of the Missouri Limestone Producers Association was held in Columbia, Mo., on December 15 and 16, and was followed immediately on December 16 and 17 by a short course sponsored by the Soil Fertility and Plant Nutrition Council of Missouri on the campus at the University of Missouri. Keynote speaker of the short course was Russell Coleman, president, National Fertilizer Association. About 300 attended the short course and the tenth annual meeting of M.L.P.A.

Officers elected for 1955 were: president, Albert Richardson, Forest City; vice-president, O. L. Taetz, Gray Summit; secretary-treasurer, Roy E. Mayes, Carthage. Members of the board are: M. M. Green, Carrollton; Joe Howard, Ozark; Earl Thomas, Sedalia; Arly Brooks, Kahoka; H. E. McClain, Wellsville; Ben Lustig, Independence; and Oliver Taetz, Gray Summit.

An outstanding talk at the Missouri Limestone Producers Association convention was given by Hon. Geo. C. Christopher, Congressman, Missouri 4th district. Rep. Christopher said that on his return to Washington, D. C., he proposed to correct the mistake of tying soil conservation to crop acre allotments and marketing quotas. He said that soil fertility and improvement was so important to the welfare of man that it was foolish to limit it in any unreasonable way such as the crop allotment specification. "Soil improvement in any federal program should be available to all farmers, not to a limited few," he said.

Robt. M. Koch, secretary of N.A.L.I., reported that soil testing programs throughout the nation had curtailed limestone tonnages extensively. He said that Missouri's soil testing program was the best in the country, but that it had slowed the use of agricultural limestone in Missouri during 1954. Mr. Koch urged Missouri agricultural limestone producers to rise together and demand that the state ASC committee discard mandatory soil testing in the 1955 ASC program. The Missouri association voted unanimously, less one, to follow the suggestion of Mr. Koch and conveyed their opinion to the state ASC Committee, the members of which were attending the meeting.

Dr. W. A. Albrecht, international soils expert and chairman of the department of soils, University of Missouri, reassured producers that agricultural limestone was the most important soil treatment necessary in Missouri. He added that other fertilizers are necessary for optimum pro-

(Continued on page 120)

Left to right: Jack Edson, Everett Quarries, Plattsburg; Earl Thomas, Sedalia; and H. E. McClain, Wellsville, new board member

Left to right: Roy E. Mayes, Carthage Marble Corp., Carthage, secretary-treasurer; John Miller, Montgomery City; and Murray Colbert, chairman, Missouri ASC

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Construction Equipment Division
LIMA, OHIO, U.S.A.

Missouri Agstone Meeting

(Continued from page 118)

duction, but that other fertilizers will not be effective without the calcium and magnesium. He contended that a national soil testing regulation should not be forced on farmers because it was impossible to write such a regulation. This should be left to individual states for regulation and operation.

John N. Fallon, extension soils specialist, showed a chart that depicted the use of liming materials in Missouri for the past two decades. The chart showed an anticipated increase in use of agricultural limestone in Missouri during 1954. This caused much comment from producers who had been polled and believed that the state's tonnage would be down from 1953 about 35 percent. Mr. Fallon attempted to substantiate his claim that mandatory soil testing would not materially reduce the Missouri agricultural limestone program in 1954, as expected by Mr. Koch, the Missouri producers and others present. The final 1954 liming materials tonnage figure for the state is anxiously being awaited by producers.

Arly Brooks and Russel Hunt, producer members of a panel discussion, agreed that soil testing was a fine indicator of fertility needs. However, they were of the opinion that compulsory soil treatments put farmers in another "straight jacket" that was not good for agriculture as a whole. They believed that farmers should be given the privilege of cooperating with the federal government to the extent of their respective economic abilities.

Dr. Geo. E. Smith pointed out the increased need for magnesium and other plant nutrients. He said that agricultural limestone producers needed to pay more attention to agronomic and biologic aspects of their business and less attention to some of the other aspects that seem to receive most attention.

Hendren and Andrae, attorneys at law, Jefferson City, were retained as counsel, and Paul N. Doll as manager during 1955.

Florida Phosphate

FLORIDA PHOSPHATE SALES for 1953, amounted to $55,612,272 for 9,166,855 tons, 8 percent higher than total sales in 1952, as reported by the State Chamber of Commerce. The Florida phosphate production accounted for 73 percent of the national output in 1953.

Cement Research Grant

THE BUREAU OF RECLAMATION has received from the National Science Foundation a $10,000 grant to further research on the hydration of cement.

The Pay Off!

Strange things frequently happen inside industrial stacks! Buell specialists can tell you, for they've spent the past twenty years finding out!

That's why so many of America's Leading Corporations depend on Buell knowledge and experience for the *recovery of valuable industrial dusts*. They know, for example, that Buell maintains a modern laboratory devoted to the analysis of industrial dust. They know that Buell provides three separate systems of industrial dust recovery. They know that the Buell Cyclone combines simple design with high efficiency . . . low maintenance. They know that the famous Buell Spiralectrode is setting dust collection efficiency records in the Buell 'SF' Electric Precipitator.

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Rotary Kiln Efficiency

(Continued from page 109)

true, others not. However, in general these factors tend to compensate each other, making it close to true.

It is not really the capacity, it is the wall exposure per unit of capacity that governs the radiation loss and by special arrangements; such as, kiln segmentation, kiln size reduction or capacity increase, wall exposure per unit of capacity is reduced and radiation minimized. Furthermore, segmentation reduces kiln temperatures throughout the length, and as the loss is not proportional to the temperature, lowering the mean kiln temperature 500 deg. F. would very greatly reduce the loss.

Slag Cement

(Continued from page 115)

ment or runway in a relatively short time. Even almost invisible fissures are detected at once, as well as poor resistances.

Experience has shown, according to Mr. Mayer, that there is no difference in the results with the various slag cements so long as they are a standardized, controlled quality and the conditions of use are good.

The only difference is that slag cement should not be used when the temperature is around the freezing point. The set is slowed down more than with portland cement. Whereas with portland cement, at 32 deg. F., the resistance of concrete after seven days is half what it would be at 66 deg. F., the resistance of slag cement is less than 40 percent. After 90 days, both are virtually equal, but at the start, the set of the slag cement is slower.

As the airfields are completed, the various air commands are making their own tests for reliability. Doubts that had spread among fliers as the result of the long drawn out technical controversy have, it is hoped, been largely favorably resolved. Mr. Mayer believes that if local defects are found in a number of places — as has been the case every time a rush job has been accomplished in adverse weather conditions — the spotlight should no longer be turned on the cement manufacturers as the slag products were exonerated by the Board of Inquiry.

Moves Office

THE PORTLAND CEMENT ASSOCIATION, which maintains its general offices in Chicago, Ill., has announced that its eastern regional office and the New York district office have been moved from 347 Madison Ave., to 250 Park Ave., New York 17, N. Y. M. J. McMillan is eastern regional manager, and W. J. McIntosh is district engineer.

1 high-speed, rubber-tired tractor replaces 2 crawlers

for North American's Catskill Plant

Tournatractor speeds from job-to-job at 19 mph. This speed enables one machine to keep up-to-date on all the "housekeeping" jobs that formerly kept two crawler-tractors busy.

Instant-shift, plus reverse speed of 8 mph, enables operator to work in and out around shovel without delays to load cycles. Electrical-control down-pressure permits smooth cleanup of the rocky floor.

North American Cement Corporation quarries about 2,000 tons of limestone daily at their Catskill Plant near Alsen, New York. To handle shovel cleanup and other tractor work, they brought in a 19 mph Tournatractor to replace 2 crawlers.

All-around handyman

Tournatractor's main task involves cleaning the pit floor around the shovel, and dozing rocks and material back to the toe after the face is shot. The versatile unit also removes dirt wash from the top of the bank, cleans up truck spillage on haul roads, and hauls cable to drilling rigs. It also cuts new haul roads and clears overburden of trees and brush. Not only has Tournatractor proved far faster than the crawlers it replaced, but its big tires roll easily over the sharp-edged rock fragments which caused excessive track wear and breakage.

Says Foreman John Nickolitch, "For quarry use, Tournatractor is ideal."

"You don't get the bounce on this work you do with a crawler," adds Operator George Wagner. "Also, you have better control of your blade."

Tournatractor's fast working speeds on rubber can pay off in increased production and lower maintenance costs for you, too. Ask for a demonstration of Tournatractor on your job. Judge its advantages for yourself.

Recently, Westinghouse Air Brake Company purchased from R. G. LeTourneau, Inc. their earthmoving and related products together with their Peoria, Toccoa, and Australian factories. Adding the high quality standards, precision manufacturing experience, and research facilities of Westinghouse Air Brake to the earthmoving developments of LeTourneau, gives you assurance that the improved line of equipment offered by this strong new company is the finest on the market. Be sure to check LeTourneau-Westinghouse before you buy.

Tournatractor—Trademark T-609-Q-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Rocky's Notes

(Continued from page 51)

all be retired at 65, which increases the cost of operation at the very time when product cost is increasing due to a lower volume of output.

Annual Wage Demand

The C.I.O. has also announced that it will put up a stiff fight in 1955 for a guaranteed annual wage. Here again, is some sound advice from Mr. Morse: "Actually only a going business can provide steady pay. Steady sales are what makes steady production, which in turn means steady work and steady pay. Because no company could long meet its payroll if it were losing business, the idea that it could 'guarantee' employment or pay is pure nonsense. Reliable studies of the problem all point out that any guarantee of employment or pay that reduces the flexibility, stability, or financial strength of a company jeopardizes the very result the plan is seeking to attain.

"On the other hand, in proportion as such a plan pays for work not done, or reduces the incentive of employes to work, or cuts down their employment mobility, it increases costs and prices and reduces employment opportunity. Here again amidst the cross currents of the labor scene, we need to take the time and effort to see clearly and think straight. We do need to do a far better job of employment stabilization and of improved productivity, the only sound way to greater job security. Then, if we need some change in our unemployment benefits plan, let's make an honest attack on that problem directly. What that may involve in the way of relaxation of seniority provisions to provide necessary flexibility of transfer to avoid layoff, what changes in work rules to permit less disruptive or uneconomic introduction of improved technology, or what new methods of deferred or advance compensation remain to be worked out."

Promotional Program

NATIONAL GYPSUM CO., Buffalo, N. Y., has embarked on a new consumer advertising campaign with a series of double-page advertisments in the *Saturday Evening Post*. The new ad series with the headline "Looking for Your Dream House?" is a departure from National Gypsum's regular product advertising in shelter magazines, hobby books and farm publications. Previously, the company's consumer advertising was designed to appeal to the "do-it-yourself" remodeling market, whereas the new series is designed to help the builders of America sell more houses.

Asbestos mine moves 4000 tons daily on 8 trucks

The Johnson's Company, Ltd., with headquarters at Thetford Mines, Quebec, has been mining and processing asbestos ore in this region for close to 70 years.

Its newest mill and open-pit mine at nearby Black Lake represents an $8,000,000 development and the last word in modern equipment. Typical of its efficient methods is the daily movement of 4000 tons of asbestos ore on 8 big Mack dump trucks over a ¾-mile haul from the mine to the primary crusher.

To keep its ore moving on uninterrupted schedule, The Johnson's Company decided their best investment was Mack. They accordingly purchased the 8 Model LV, diesel-powered Mack trucks of 22½ tons capacity. Actual performance of these trucks, each carrying 500 tons daily, has more than confirmed the wisdom of the company's choice.

MACK TRUCKS Empire State Building, New York 1, N. Y.

Labor Relations

(Continued from page 53)

First twenty-four-hour period.

8 hours straight time 8 x 2.07	$16.56
8 hours layover — no charge	
8 hours overtime 8 x 1½ x 2.07	24.84

Second twenty-four-hour period.

1 hour at 2.07	2.07
10 percent of trip time as estimating contingency 0.10 x 17 x 2.07	3.52
Trip rate	$46.99

"It should be noted again that the recognized union rate in the area for this truck driving was $2.07 per hour with no provision for premium pay for overtime. By comparison with respondent's $47.00 trip rate, the union rate for this same trip was:

17 hours at 2.07—17 x 2.07	$35.19
10 percent contingency 0.10 x 17 x 2.07	3.52
Union Rate	$38.71
Respondent's trip rate	$47.00
Union trip rate	38.71
Difference	$ 8.29

"A number of respondent's competitors actually paid this lower union wage scale for identical trips.

"It is established that this method of arriving at the trip rate was explained to the truck drivers and accepted by them either at the time of their hiring, or very soon thereafter by James Grosso, the respondent's office manager and dispatcher (R-76, 77, 78, 79). The explanation included the fact that in arriving at the rate, Van Dornick had used the 'union rate of $2.07 per hour for straight time and $3.10½ per hour as overtime for the second eight-hour period in the twenty-four-hour day.' Grosso also testified that he made this explanation personally to fifteen of the twenty drivers; he did not remember as to one; and as to the other four, he requested that the men to whom he had made the explanation 'carry the word to the other drivers.'

"Van Dornick is only one of a number of southern California businessmen under contract to supply jet fuel to the Government at Nellis Air Force Base. Into the same underground tanks at Nellis goes fuel supplied by Gantley, Tonzola, Lang Transportation, System Tank Lines, and others. Some of these competitors are common carriers while respondent's company is not; as common carriers they are exempt from the overtime requirements of the Walsh-Healy Act and are governed by the abovementioned union wage agreement which significantly does not contain any agreement for premium; with drivers working at union wages for his competitors, the amounts of pay received by Van Dornick's truck drivers were higher by the $8.29 paid as overtime and this higher figure is exactly one and one-half times the basic hourly rate of $2.07. Again it must be remembered that under local custom

and Interstate Commerce Commission regulations this eight hours overtime is the most overtime worked in a twenty-four-hour period because of the required eight-hour layover.

Basic Hourly Rate

"It seems obvious that this trip-rate basis of compensation is the same as piece-rate compensation where employes are paid a fixed amount for performance of a specific task. In Rulings and Interpretations No. 3, Section 42(d) (4), promulgated by the Secretary of Labor for the administration of the Act, it is provided that where an employe is paid a piece rate his 'basic hourly rate' is computed by dividing his total wages by his total hours for the workweek. However, it does not follow that sums paid as bona fide overtime should not be excluded from such a method of arriving at the basic hourly rate for piece-rate earnings. Where overtime is paid, it must be credited as such.

"Section 42(e) of Rulings and Interpretations No. 3 provides that basic hourly rate means an hourly rate equivalent to the rate upon which time and one-half overtime compensation may be computed and paid under Section 7 of the Fair Labor Standards Act. Sections 7(f) (1), 7(g), 7(d) (5) and (7) of the Fair Labor Standards Act require that extra pay shall be credited to overtime compensation when it is paid because of overtime work or when the extra compensation is paid pursuant to an employment or collective bargaining contract for work outside of the hours established in good faith by the agreement as the basic, normal, or regular workday, where such premium rate is not less than one and one-half times the rate so established. The decision here that bona fide overtime has been paid must be credited to the respondent is entirely consistent with the above provisions; there are present both the element of good faith and an employment contract and a union agreement, each recognizing that the overtime was included in the union or basic rate.

"Furthermore, there is nothing in the cases cited by the Government which would prevent this credit being given for all overtime paid. See Walling v. Belo Corp., 316 U.S. 624 and Justice Frankfurter's concurring opinion in Walling v. Harnischfeger Corp., 325 U. S. 427, where he said in part:

" 'Nor does the Act bar an *agreement establishing an hourly 'regular rate'* * * * even though it be complicated by a guaranteed weekly lump sum wage adapted to the circumstances of a particular employment, *provided it is not a mere artifice unrelated to wage-earning actualities,* Walling v.

TWELVE YEAR TD-14 PERFORMANCE RECORD prompts Acme to put 2 new TD-14As on expanded operations. Here one of new tractors dozes blasted limestone for shovel loading into haul trucks far below surface.

"We Worked Our TD-14 12 Years Before Trading"

Says E. H. Warren, superintendent of Acme Limestone Company's underground mine

The Acme Limestone Company, Fort Spring, West Virginia, got the low-down on durability and performance of INTERNATIONAL crawlers by working a TD-14 for 12 years piling up blasted limestone for a shovel in its underground mine.

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Superintendent E. H. Warren says, *"We have been 100% INTERNATIONAL on crawlers since 1942 with our first TD-14 working 12 years before being traded. The all-around production and service we get from INTERNATIONALS speaks for itself when we buy more as replacements."*

For a long-term, dividend-producing investment in pit or quarry crawler tractor power, see your International Industrial Power Distributor. He'll demonstrate any of the seven INTERNATIONAL crawlers equipped to do your work. Then you can see for yourself how these machines pay off with peak production in handling rock, gravel or sand at less cost.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL
INDUSTRIAL POWER
MAKES EVERY LOAD A PAYLOAD

INTERNATIONAL HARVESTER

Labor Relations

(Continued from page 128)

Belo Corp., 316 U.S. 624; Walling v. Helmerich & Payne. 323 U.S. 37. Accordingly, the Fair Labor Standards Act does not preclude a wage agreement whereby piece-rate payments are related, fairly and not evasively, *partly to regular hours of work and partly to overtime*. Piece rates need not necessarily be so adjusted that they cannot fairly be designed as part of the overtime but must necessarily help 'load' the regular hourly wage. (Emphasis supplied)

" 'A properly apportioned overtime function for piece work should be clearly indicated as such in the employment contract.' "

"Mr. Justice Murphy, in the Harnischfeger Corp. case, writing the majority opinion, also stated full credit must be given for overtime payment when among other things, he stated:

" 'Our attention here is focused upon a determination of the regular rate of compensation at which the incentive workers are employed. To discover that rate, as in the Youngerman-Reynolds case, we look not to contract nomenclature but to the actual payments, *exclusive of those paid for overtime*, which the parties have agreed shall be paid during each workweek.' (Emphasis supplied)

"Contrary to the Government's theory, it is apparent that the $2.07 basic hourly rate is not so unrealistic in relation to the actual driving time as to preclude it from being bona fide. In addition to the significant union and employe agreement for such a basic rate, and the fact that $2.07 was the rate paid by common carriers doing the same work, an analysis of the exhibits establishes that respondent's seventeen-hour allowance per trip was realistic. The average or normal driving time for all 20 drivers for a total of 207 trips is 16.06 hours per trip. While it is true that some few trips took a shorter and some few a longer time, these few disgressions from the norm do not controvert the fact that it was entirely realistic to allow and contract for seventeen hours for each trip and pay for eight hours overtime per trip. The contract here for the $8.29 as overtime at the basic rate of $2.07 is also in accord with the decision in Tennessee Coal Co. v. Muscoda Local, 321 U.S. at 603, where the Supreme Court indicated that realistic and bona fide contract or custom can govern 'where precise accurate computation is difficult or impossible;' and with the decision in Jewel Ridge Corp. v. Local, 325 U.S. at 170, where it was held that contracts governing hours of work may be averaged or fixed at an arbitrary figure 'to avoid difficulties of computation.'

"For the above reasons the complaint hereby is dismissed."

Disclaims Soviet "Record"

DRUMMOND DOLOMITE, INC., Drummond Island, Mich., has disproved a claim made by the Russian newspaper, "Pravda," which stated that Russia's Stalin dolomite plant in the Donets basin had the "world's largest" production of dolomite, three-quarters of a million tons in a year." Employes of Drummond wrote a letter to the newspaper, with a copy to Soviet Premier Georgi Malenkov, stating: "We have news for you. We reached the three-quarter million mark six years ago. Last year we produced over 2,500,000 tons." Pravda reported that the Stalin plant's "remarkable production" was achieved with 350 employes. Drummond Dolomite, Inc., employs 200.

Authorizes Cement Import

ECUADOR has published an executive decree authorizing the importation of portland cement as a product of "prime necessity," as a result of increased construction demands. Previously, cement had been considered a product of "lesser need."

Ready to Roll for a Longer Grind

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GRINDING BALLS

This carload of Moly-Cop Grinding Balls might be headed to any one of hundreds of destinations around the world. Sheffield ships them everywhere grinding is part of the industrial picture.

Wherever they go, they'll do a better grinding job. Fewer chargings will be required. Less down time. Less frequent freight bills. Money saved.

That's because Moly-Cop Grinding Balls keep their spherical shape longer. Sheffield's special alloy of steel, copper and molybdenum is just the right "recipe" for longest resistance to wear, chipping and abrasion. There's a big difference in grinding balls—and it will show up on your profit sheet when you use Moly-Cop Grinding Balls.

We're ready with the best grinding ball—plus engineering counsel on how it can best save money in your operation. A call will get you all the facts.

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Deep, ragged holes		X	X	X
Extra deep holes			X	X
Deep, wet holes				X
When a field shot must stand a long time				X
River Crossings				X
Loading with heavily reinforced explosives containers			X	

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PLAIN PRIMACORD

Textile-covered, flexible and resilient. Suitable for surface trunk lines and shallow holes where tensile strength and resistance to abrasion and cutting are not required. Tensile strength 113 lbs. 1000-ft. spool 17 lbs.

REINFORCED PRIMACORD

Textile reinforced, tough, resilient, flexible. Recommended for surface trunk lines and deep holes where normal strength and resistance to abrasion and cutting are needed. Tensile strength 160 lbs. 1000-ft. spool 18 lbs.

WIRE COUNTERED PRIMACORD

Textile or plastic cover is armored with wire. Recommended for use in deep, ragged holes or with metal or fibre explosives containers, where strength and resistance to abrasion and cutting are essential. Tensile strength 220 lbs. 1000-ft. spool 33 lbs.

PLASTIC REINFORCED PRIMACORD

Covered with tough plastic material, not affected by high Summer heat or Winter cold. Waterproof—resistant to acids commonly encountered. Use for extremely deep holes, river crossings, field shots that must stand for long periods of time and in other wet conditions. Tensile strength 250 lbs. 1000-ft. spool 22 lbs.

INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

1 **AIR AND ELECTRIC HOISTS**—Ingersoll-Rand Co. has issued a 44-page catalog, Form 5300-A, describing air and electric hoists for handling bulk materials. Specifications, capacities, sizes, features and accessories for each type are given. Typical application photographs are also included.

2 **BEARING LUBRICATION** — The Texas Co. has published Vol. XL No. 10 of "Lubrication," featuring an article on industrial bearing lubrication. Photomicrographs are included.

3 **BRAKE SAFETY — MAINTENANCE** — Grizzly Manufacturing Division has released a 16-page booklet entitled, "More for Your Dollar in Longer Brake Block and Drum Life." Suggestions are given on reducing brake maintenance costs while increasing drum life and brake safety. Photographs, diagrams and charts are included.

4 **CAST STEEL SHEAVES**—Farrell-Cheek Steel Co. has released a folder on carbon and alloy cast steel sheaves, describing such features as "Cable saver" grooves and "true round" sheaves.

5 **CEMENT HANDLING**—Fanning-Schuett Engineering Co. has brought out a 20-page booklet on cement handling and storage equipment. Photographs and schematic drawings of equipment point out various installation arrangements. Dimensions, capacities and cutaway views of various equipment are given.

6 **CLAMSHELL BUCKETS** — George Haiss Manufacturing Co., Inc., has announced Bulletin H-1954, describing and illustrating the complete line of MultiSheave clamshell buckets, including the ¼- and ½-cu. yd. trenching buckets, general purpose and Hi-Power digging buckets.

7 **COMMUNICATION SYSTEMS**—TelAutograph Corp. has released a 16-page, eight color booklet on planned plant communication systems. Six basic manufacturing problems are illustrated and analyzed, and schematic diagrams point out typical systems. The TelAutograph Transcriber systems are also explained.

8 **COMPRESSORS**—Chicago Pneumatic Tool Co. has brought out Bulletin 734, describing the complete line of "Power Vane" portable rotary compressors in 125, 210, 365 and 600 c.f.m. sizes.

9 **CONCRETE BLOCK MACHINES** — The Gene Olson Corp. has announced a bulletin describing the advantages, operation and maintenance of its plain pallet block machines, designated the "King" and the "Senior." Dimensions and illustrations are included.

10 **CONCRETE FORMING SYSTEM** — Symons Clamps & Manufacturing Co. has announced an eight-page catalog describing and illustrating the Symons Forming System, explaining erecting and stripping advantages, and giving illustrated examples of its use in the construction of battered walls, round tanks, reinforced high walls and mass production homes.

11 **CONCRETE MIXERS** — Koehring Co. announced a 16-page pictorial catalog describing the mechanical and application features of its line of volume production concrete mixers. Both the tilting and non-tilting types are discussed.

12 **CONVEYOR BELT CLEANER** — Stephens-Adamson Manufacturing Co. has announced Bulletin 651, describing and illustrating the S-A conveyor belt cleaner. Typical installation photographs, sectional views, typical mounting arrangements, and dimensions are given.

13 **CRAWLER-TRACTOR** — Allis-Chalmers Manufacturing Co. has issued a 30-page catalog describing the HD-9 diesel-powered crawler tractor. A three-page cutaway view, typical application photographs, and illustrations of allied equipment and special accessories are given. Specifications are also included.

14 **CYCLONE CLASSIFIERS** — Equipment Engineers Inc. has released Bulletin 121, describing and illustrating the Krebs cyclone classifiers. Specifications are given for each model, and advantages and design features are described.

15 **DRILL JUMBOS** — Gardner-Denver Co. has announced Bulletin J-100, describing a complete line of drilling equipment, including straight and offset hydraulic booms, hydraulic lift and swing cylinders, and hydraulic pumps, for mounting. Also described are completely equipped hydraulic drill jumbos for rail service, the Mobiljumbo with remote drill controls, tractor-mounted units with air compressors, etc.

16 **DUMP BODIES** — The Heil Co., Body and Hoist Sales Div., has prepared Bulletin BH-54110, describing and illustrating the features of the Model HH-11 dump bodies. Specifications are also included.

17 **DUMP BODIES-HOISTS** — The Gallon Allsteel Body Co. has issued Catalog L-9828, describing the Model 12N-4 bodies and Model 740, 770 and 800 hydraulic hoists. Action photos, cutaway views and line drawings illustrate construction features, mechanical details and design advantages. Specifications covering the series are included.

18 **ENGINES** — Westinghouse Air Brake Co., Le Roi Division, released Bulletin E-7, describing and illustrating the Le Roi L3460 and L4000 engines. Cutaway views show design features, and horsepower rating charts and specifications are included.

19 **FLOTATION** — Denver Equipment Co. has published a September-October, 1954, issue of "Deco Trefoil," featuring technical data concerning flotation of non-metallics, recovery of tungsten, concentration of spodumene, as well as information on an automatic dust-tight sampler and the Denver-Finney belt-type classifier. Fifteen flowsheets of typical plants illustrate how various flotation problems have been solved.

20 FLUID COUPLINGS — Twin Disc Clutch Co. has issued a bulletin, No. 144-D, giving complete installation and performance data on fluid couplings. Diagrams, drawings, dimension tables, and typical application photographs are given.

21 HARD-FACING—Wall Colmonoy Corp. has issued a four-page bulletin, illustrating and describing the Model C Spraywelder and the Sprayweld process. A list of typical applications is given, as well as photos showing specific applications.

22 HEATED SCREENS—Universal Vibrating Screen Co. has brought out Bulletin 140, describing and illustrating "Unilec" electrically-heated screens. Installation details, current characteristics, and operation data are included.

23 HEAVY DUTY MOTORS—General Electric Co. has issued Bulletin GEA-4654C, describing armored motors, d-c types MD and MDP, 600 series, giving performance and maintenance features. Horsepower ratings, mechanical data, diagrams and photographs are included.

24 HEAVY MEDIA EQUIPMENT—Western Machinery Co. has released Bulletin L-1-I-1, describing laboratory heavy media equipment for batch or continuous processing. Application data, product characteristics, specification drawings, and data covering the Wemco HMS laboratory cone unit, drum unit and media cleaning unit are included.

25 HEAVY MEDIA SEPARATION—The Ore & Chemical Corp. has issued a brochure announcing the "OCC" HMS separatory vessel. Installation, product flow, operation, power requirements, maintenance data, etc. are covered. A diagram is also included, which shows the operating principle.

26 HYDRAULIC CRANE — Austin-Western Co. has brought out Bulletin AD-2253, describing its indoor-outdoor hydraulic crane. Diagrams on working ranges, manual boom extensions, etc., specifications and performance data are given. Also described are attachments and special equipment.

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27 **INDUSTRIAL ENGINES**—Willys Motors Inc., Industrial Engine Dept., has announced a bulletin describing two 6-cylinder industrial engines. Power curves, engine specifications, illustrations and special features are included.

28 **LIFT TRUCKS**—The Yale & Towne Manufacturing Co. pictures and describes its gasoline, diesel and LPG industrial lift trucks from 1000 to 10,000 lb. capacities, in a 12-page bulletin, No. 5101C. Included are cutaway photographs, attachment descriptions, and a check sheet of specifications.

29 **MATERIALS HANDLING** — Towmotor Corp. has released a brochure entitled "Here's How to Lift Your Handling Costs Out of The Red." Typical application photos show in action, various equipment models, such as electric pallet trucks, fork lift trucks, etc.

30 **MOTORS AND LUBRICATION** — U. S. Electrical Motors Inc. has announced Form 1848-150M-10-53, describing and illustrating various type motors and the Lubriflush method of lubrication. Performance data, cutaway views, and case histories are given.

31 **MUFFLER**—The Yale & Towne Manufacturing Co. has brought out a catalog sheet, No. ED-23, describing and illustrating the Yale Cyclone Muffler. A sectional drawing is also included, showing operation of the muffler.

32 **OIL-AIR REGULATOR**—Hauck Manufacturing Co. has brought out Bulletin 723, announcing an oil-air ratio regulator for low pressure burners. Operation details, dimensions, line drawings and a parts list are included.

33 **PROCESS METHODS** — Western Machinery Co. has issued Bulletin L-1-C-1, illustrating and describing laboratory testing of process methods for metallic and non-metallic materials. Also included is an analysis of typical process problems and their solutions.

34 **PROTECTIVE APPAREL** — Surety Rubber Co. has announced a bulletin describing Surcosol synthetic rubber for industrial gloves and other industrial protective apparel. Charts are included showing tensile strength, snag resistance and swelling.

35 **PYROMETERS**—The Bristol Co. has published Bulletin P1244, describing and illustrating its complete line of millivoltmeter pyrometers and accessories. Included are Model 580 indicating pyrometers for service up to 4000 deg. F.

36 **REFRACTORIES**—The Refractories Institute has published a 157-page book entitled "Product Directory of the Refractories Industry in the United States," 1954 edition. It lists names and addresses of manufacturers of refractories in the United States, the locations of plants, the product divisions and the brand or trade names under which the products are sold.

37 **RUBBER-TIRED TRACTOR** — LeTourneau-Westinghouse Co. has issued Form 54-005-T, a 28-page folder, describing and illustrating features of a 208-hp., rubber-tired tractor. Diagrams and charts are included.

38 **SAMPLERS**—Denver Equipment Co. has prepared a bulletin, No. 81-B4, giving specifications, detailed data, charts and photographs, describing various samplers designed for applications where dust is a problem, where headroom is limited, or where samples are required from points in the concentration circuit.

39 **SHOVEL HOIST DRIVE** — Harnischfeger Corp. has published Bulletin X-156, describing and illustrating Magnetorque hoist drive for P & H shovels. Typical application photographs, a schematic drawing, cutaway drawings, and a comparison chart are included.

40 **SPEED VARIATOR**—The Cleveland Worm & Gear Co. has brought out Bulletin K-100, describing the advantages, features, and operation of the Cleveland Speed Variator. A typical speed regulation curve, standard dimensions, and engineering drawings are included.

41 **STRUCTURAL SYSTEM**—The Flexicore Co., Inc., has released a folder entitled "Row Housing With Flexicore," outlining a fire-resistant, structural system for row housing, dormitories, motels, garden apartments and similar projects. Typical construction photographs and design diagrams are given.

42 **TELESCOPIC HOISTS** — The Heil Co., Body and Hoist Div., has prepared Bulletin BH-54111, covering the line of telescopic hoists including Models 2T62-64, 2T72-64, and 2T73-96 with capacities of 21 to 30 tons.

43 **TOOL BITS**—Allegheny Ludlum Steel Corp. has brought out a revised edition of its technical information bulletin on ALX alloy tool bits. Data is included on applications, grinding, tool angles, speeds and feeds, brazing and stock sizes.

44 **TRACTOR-BACKHOE** — Allis-Chalmers Manufacturing Co. has brought out Catalog MS-982, outlining features of the Model WD-45 wheel tractor equipped with Henry backhoe and other Henry hydraulically operated equipment. Specifications, a cut-away view of the tractor's powerline, and other illustrations are included.

45 **TRACTOR-LOADER** — Lessmann Manufacturing Co. has released Bulletin 74, describing and illustrating the Model GFT tractor-loader. Specifications are included.

46 **TRACTOR MANUFACTURING** — Allis-Chalmers Manufacturing Co. has brought out a booklet entitled, "Highlights — Allis-Chalmers West Allis Works," giving a pictorial tour of its operations at the Tractor and General Machinery Divisions, showing how the equipment is manufactured and shipped.

47 **TRACTOR-SHOVELS** — The Frank G. Hough Co. has prepared literature entitled, "Useful Attachments for 'Payloader' Tractor Shovels," describing and illustrating 16 attachments. The line of seven sizes of "Payloader" tractor-shovels, for indoor and outdoor use are also shown.

48 **TRACTORS-MOTOR GRADERS** — Caterpillar Tractor Co. has issued Form D477, entitled "Old, But Still Producing," giving photos and testimonials for tractors, motor-graders, electric sets and engines over 15 years old and still operating. The factory to customer parts set-up is also shown, and the "no parts orphans" policy is explained.

49 **TRANSMISSION** — Raybestos-Manhattan, Inc., Manhattan Rubber Div., has issued Bulletin 6638, describing the Poly-V drive. Design characteristics and line drawings are given, pointing out specific advantages claimed for the belt power transmission.

50 **TRUCK CRANE** — Harnischfeger Corp. has brought out Bulletin TX-159, describing and illustrating the P & H Model 105 TC truck crane. Typical application photographs are included, and details on the P & H carrier, for use with the crane, are also given.

51 **VERMICULITE** — Zonolite Co. has announced a 16-page data book, giving over 40 industrial applications of vermiculite. The book, a 1955 revision of a data book on the mineral's chemical and physical properties, includes a three-page section on absorption, catalytic, dielectric, filler, insulation, lubrication, resiliency, and thermal expansion characteristics of vermiculite.

52 **WIRE ROPE** — Macwhyte Co. has released Bulletin 5201, entitled "Macwhyte Safe-Lock Wire Rope Assemblies." Drawings, photos and specifications are given for each assembly.

53 **WIRE ROPE** — Macwhyte Co. has published Bulletin 5448, entitled "Ropeology," describing and illustrating special boat slings, barge tow line, logging operation, cable assemblies, slings, and aircraft cable used on the Super 18 Beechcraft and Boeing Jet Stratotanker airplanes.

54 **WIRE ROPE ELECTRIC HOISTS**—The Yale & Towne Manufacturing Co. has issued a 16-page brochure, No. P-495-A, picturing and describing the Yale Cable King line of wire rope electric hoists. Cutaway photographs, charts and diagrams are included.

Detach and Send Us This Post Card

ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago, Ill. (RP 2-55)

I would like to have the items circled

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54						

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Street _____

Company _____

City & State _____

Nova Scotia Gypsum Quarry

(Continued from page 71)

crushed gypsum rock to the car loader.

Rock will be transported by railway freight cars from the quarry to new dock facilities at Dartmouth, 30 miles away. Loaded cars will be moved, one at a time, into the rotary car dumper at the dock site. This dumper will clamp the 80-ton cars, turn them upside down and deposit the contents to a holding bin from which a belt conveyor will take the crushed gypsum rock to the dock stockpile.

This stockpile will contain 175,000 tons of raw gypsum rock. Underneath the stockpile is a tunnel belt conveyor which will move the material at the rate of 4000 t.p.h. to the ship loader. The loader is a traveling bridge which will move along the 646 ft. length of the dock to load the ship.

Cement to Alaska

PERMANENTE CEMENT CO., Oakland, Calif., recently delivered the 1,000,000th barrel of cement in Alaska from its Anchorage, Alaska, distribution plant, according to an announcement by W. A. Marsh, vice-president and general manager.

During 1949, Permanente Cement Co., with the cooperation of the Alaska Railway and the Defense Department, explored the possibility of bringing bulk cement to Alaska to supply the growing needs of commercial builders and the series of defense projects planned for Alaska. Permanente's bulk facility plant in Anchorage reportedly has resulted in lowering the delivered price of cement in Alaska by 40 percent, and has encouraged the installation of a number of privately owned concrete batching plants in the Anchorage-Fairbanks area.

Institute Moves Offices

THE ASPHALT INSTITUTE has moved its executive offices and laboratories to the campus of the University of Maryland, at College Park, near Washington, D. C., to enable expansion of its research and engineering operations. The Institute's division office in Washington, D. C., has also been closed, and a new division office opened in New York City, at 1270 Avenue of the Americas.

Cement Movie Film

CALAVERAS CEMENT CO., San Francisco, Calif., recently placed in distribution a sound and color motion picture describing the cement production process at its San Andreas, Calif., plant. The 16-mm. film, "Gray Gold from the Mother Lode," is being made available for showing to trade associations, professional societies, luncheon clubs, and church and school groups.

Cut Bagging Costs

(Continued from page 77)

When the difference in cost for the same bag size is $.01, there is over a $50 savings per 8-hr. shift when operating at rates of 20 bags/min. When bagging at 6/min. there is a savings of about $8 per day.

Note, however, the difference in cost is less when smaller bags are compared. The reason is that in the range of smaller sizes, open-mouth bags come with extra material on top to facilitate closing.

How expensive are small changes in bag size? Slight difference in paper bag size, such as a 1-in. change in either length or width, involves in many cases such a small difference in cost that it may not be significant. But a 1-in. change for cloth bags costs from $.005/bag and up, which is substantial.

Improper Amortization

A nationally known process company amortizes its equipment in three years. In doing so it makes allowances for Federal Excess Profits Tax, considering the 52-percent tax possibility.

How much could this company afford to spend on equipment that would eliminate one man from bagging operation? Figuring the cost again of one operator as $4500 per year, the cost under a three-year amortization amounts to $13,500. Under the 52 percent tax, a $6500 investment is in order.

A company, however, may find it

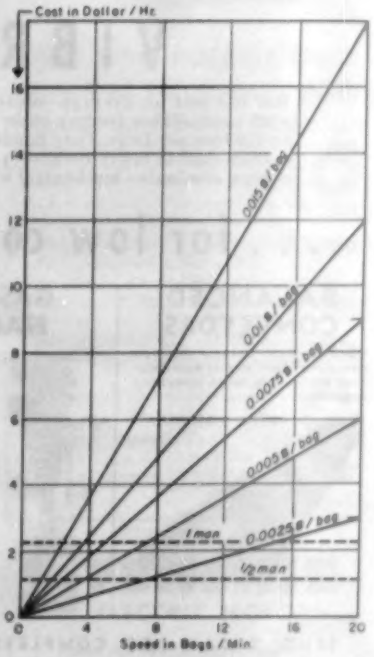


Fig. 4: Container cost for increment of bag size

Why brute loads don't "bust" this screen

● Here's a screen built to take abuse . . . a screen specifically designed to handle large quantities of *big, heavy* rock and ore.

The main frame of this powerful PIONEER Mesabi Vibrating Screen is built from 18" car channel or I-beams and reinforced with 8" wide flange cross beams. Screen frames are constructed from extra-heavy channels, pipe, angles, and bars. Pan side thicknesses range from ⅜" to ½", depending on size of screen. Angle bracing at critical points adds further strength and rigidity. Beefed-up shafts are built to take it.

EFFICIENCY. PIONEER Mesabi screens are not only rugged, but you just can't beat them for fast, accurate separation.

That's because PIONEER's full circle, forward throw agitation produces an identical, positive motion from one end of the pan to the other. Every inch of this screen works for you.

Near-perfect balance is maintained by placing the shaft at the pan's exact gravitational center and counterbalancing the flywheels to offset the throw of the pan. This gives precise end-for-end, top-for-bottom balance at all times. Since vibration is confined to the pan and not transmitted to the frame, less power is needed and equipment lasts longer.

OUTPUT. PIONEER screens are known for their extra capacity. Positive throw, down-hill agitation, and use of the entire screen surface, combine to deliver maximum tonnage.

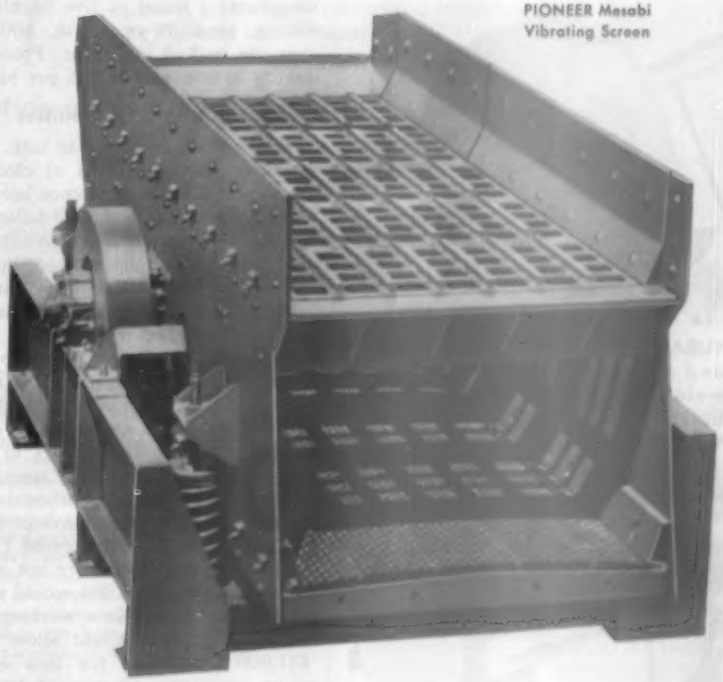
SPECIFICATIONS

Size	Horse-power	Approximate weight in pounds		
		1 Deck Scalping	2 Deck Scalping	2-Deck Gradation
4'x10'	15	8,900	8,800	8,000
4'x12'	15	10,000	10,000	9,100
5'x10'	20	11,800	11,800	11,000
5'x12'	20	12,800	12,700	12,000
5'x14'	25	13,700	13,600	13,000
6'x12'	30	14,550	14,200	13,800
6'x14'	30	15,800	15,300	14,900

Ask your screen salesman these questions

1. Will frame resist sagging and twisting under heavy loads?
2. Is vibration effectively confined to pan?
3. Do both ends of screen vibrate equally with the middle?
4. How efficient, percentagewise, is separation?

PIONEER Mesabi Vibrating Screen



For detailed features, specifications, and performance data, write Pioneer Engineering Works, Inc., Minneapolis 13, Minnesota, or see your nearest PIONEER Distributor.

BUY BOTH! HIGHER OUTPUT LOWER UPKEEP

Pioneer *Continuflo* EQUIPMENT

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago
Please send information on equipment checked.

- ☐ GRAVEL PLANTS ☐ WASHING PLANTS ☐ MECHANICAL FEEDERS
- ☐ ROCK PLANTS ☐ BITUMINOUS PLANTS ☐ VIBRATING SCREENS
- ☐ JAW CRUSHERS ☐ APRON FEEDERS ☐ BUZZER SCREENS (LIGHT DUTY)
- ☐ ROLL CRUSHERS ☐ GRID FEEDERS ☐ CONTINUFLO CONVEYORS

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*City*_____ *Zone*___ *State*_____

desirable to streamline an operation in preparation for a highly competitive period in spite of current profit incentive. By and large, most processors change their feeling toward amortization with the business outlook, just as most people change their attitude toward investments with the business outlook.

Figuring Interest

Interest as a cost of operating a bagging installation generally can be overlooked. Assume you have to buy new equipment to improve your bagging operation. After making comparative studies of equipment available, you find that the difference in cost of competitive equipment is $10,000.

At a 6 percent interest rate, the average yearly interest for the amortization period will be about $300. At an operating speed of five bags/min. with a one-shift operation, 600,000 bags are packed in a year. Prorated, interest amounts to $.0005 per bag.

Five Cost-Cutting Possibilities

THE IMPORTANCE OF BAG SIZE. In a speed-up, one extra inch of cloth in the bag may be the difference between the success or the complete failure of a bagging operation. Take an extreme case for an example: a speed-up for two men from 6 cloth bags/min. to 20 bags/min., which would be an absolute top for two men.

As a result of the speed-up, we would reduce labor, Fig. 3, from $.0125 to $.0036 per unit, saving $.009 per unit. But, in a speed-up it is often necessary to use larger bags to ease bag handling at the higher speeds. In this case, using a conventional cloth bag, there would be no savings if the bag length had to be increased 1 in.

If the size-increase were not necessary, however, the $.009 would represent about $21,000 in a working year (2000 hr.). This would allow for a $31,000 investment for new equipment, using the 52 percent tax and the three-year amortization.

WHEN YOU CAN SACRIFICE ACCURACY FOR PRODUCTION. In bagging chemicals, poultry feed or other relatively high-cost commodities, a speed-up is not worthwhile if accuracy is compromised. There is little risk in a speed-up, however, when low cost commodities, such as minerals, are being bagged.

For example, as a result of the extreme speed-up mentioned above, there was a $.009 savings per bag. If this speed-up resulted in a 3-oz. greater inaccuracy bagging poultry feed ($.05/lb.), or a 1-oz. greater inaccuracy bagging a chemical ($.25/lb.), it would just about wipe out the

Have you a dust recovery problem?

Bring it to WESTERN PRECIPITATION

... The Only Organization With Years Of "Know-How" In BOTH *Electrical* And *Mechanical* Recovery Methods!

If you have any kind of a suspension-recovery problem—whether dust, fly ash, fume, fog or mists—it will pay you to bring it to the leading organization in the field . . . WESTERN PRECIPITATION CORPORATION. Western Precipitation not only pioneered, over 44 years ago, the first commercial application of the now-famous COTTRELL Electrical Precipitators, but also has been a leader for many years in the *mechanical* recovery field with its widely-accepted MULTICLONE Collectors.

Result:

Western Precipitation is unsurpassed in the all-important factor of "know-how" in BOTH the electrical and mechanical fields . . . knows from years of first-hand experience whether your particular problem can best be solved by mechanical or electrical methods—*or by a combination of the two* . . . can give you a direct and unbiased recommendation on the matter . . . and then can provide the complete installation under *one* responsibility, *one* overall performance guarantee, even where Combination Multiclone-Precipitator (CMP) installations are made!

Western Precipitation products and services include . . .

COTTRELL

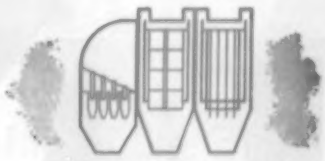
Electrical Precipitators

. . . the most efficient recovery equipment for high recovery, long life, low maintenance on practically any type of suspensions, wet or dry. COTTRELLS can be designed to handle a few c.f.m. —or millions—with equal ease, and at virtually any operating temperature. Recovery efficiencies closely approach 100% recovery, if desired, with very low draft loss, minimum power costs and negligible labor costs. *By all standards, Western Precipitation COTTRELLS give highest recovery at lowest cost per-year-of-service!*

MULTICLONE

Mechanical Collectors

. . . the most efficient, most compact, most trouble-free mechanical equipment for recovering suspensions from gases. Because of their unique small-tube design, MULTICLONES are unsurpassed in mechanical recovery efficiencies—require less space, less maintenance, and are far simpler to install. No filters or screens to replace, nothing to burn or cause fire hazards, no high speed moving parts to repair or replace. These and many other advantages make MULTICLONE Collectors the logical choice on installations where mechanical recovery is selected.



CMP UNITS

(Combination Multiclone-Precipitator)

. . . combine, in *one* compact installation, *both* mechanical and electrical recovery principles so that maximum benefit is obtained from the advantages inherent in each method. The MULTICLONE section centrifugally removes the larger and heavier suspensions (down to a few microns in diameter) . . . and the COTTRELL section then electrically removes the very small particles remaining in the gases. Thus, the bulk of the recovery is obtained with relatively low-cost equipment, and the final clean-up is obtained with equipment having unusually high recovery efficiency—approaching theoretically perfect, if desired.

The recovery of suspensions from gases is a highly exact science and every problem is different. Some require mechanical methods—others electrical methods—still others a combination of mechanical and electrical methods in proper balance to meet the individual requirements of each application. No matter what your problem, remember that only Western Precipitation has had years of field experience in BOTH mechanical and electrical methods!

Send for descriptive literature!

Let our experienced engineers study your recovery requirements and make an unbiased recommendation on the equipment best suited to your particular problem. A wire, phone call or letter to our nearest office places this unique "know-how" at your service, without obligation.

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENSION MATERIALS FROM GASES & LIQUIDS

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PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

MULTICLONE—T.M. Reg.

savings. However, the $.009 speed-up saving would pay for about 1 lb. of material per bag in the mineral class ($.01/lb.).

WHEN IT PAYS TO IMPROVE ACCURACY. Accuracy improvements can be justified easily. Consider bagging a $.05/lb. material (feed) in 50 and 100-lb. bags at a rate of 12/min. where the bagging scale accuracy is plus or minus 4 oz. Improving the accuracy 2 oz. would save $4.50/hr. (Figs. 1 and 2). This savings would justify an investment of $13,000 for more accurate equipment, using the three-year amortization figures and the 52 percent tax.

Incidentally, the $4.50-saving is equivalent to the labor cost of two men. Therefore, two 2-man bagging systems operating at 6/min. at a 2-oz. accuracy, consequently, are no more costly than two men doing 12/min. with a 4-oz. accuracy.

WHETHER IT IS CHEAPER TO USE VALVE OR OPEN MOUTH BAGS. If the operation is slow and the problem involves bag cost, the open-mouth bag is probably to be preferred. If bagging could be done with a non-tuck-in sleeve and a glued bag, the valve bag would be preferred.

The valve bag, although it costs more than the open-mouth bag, is less costly to handle. Requiring no closing operation, it allows one man to run a bagging installation. At bagging rates lower than 5 or 6/min., however, one man can weigh-out and close open-mouth bags.

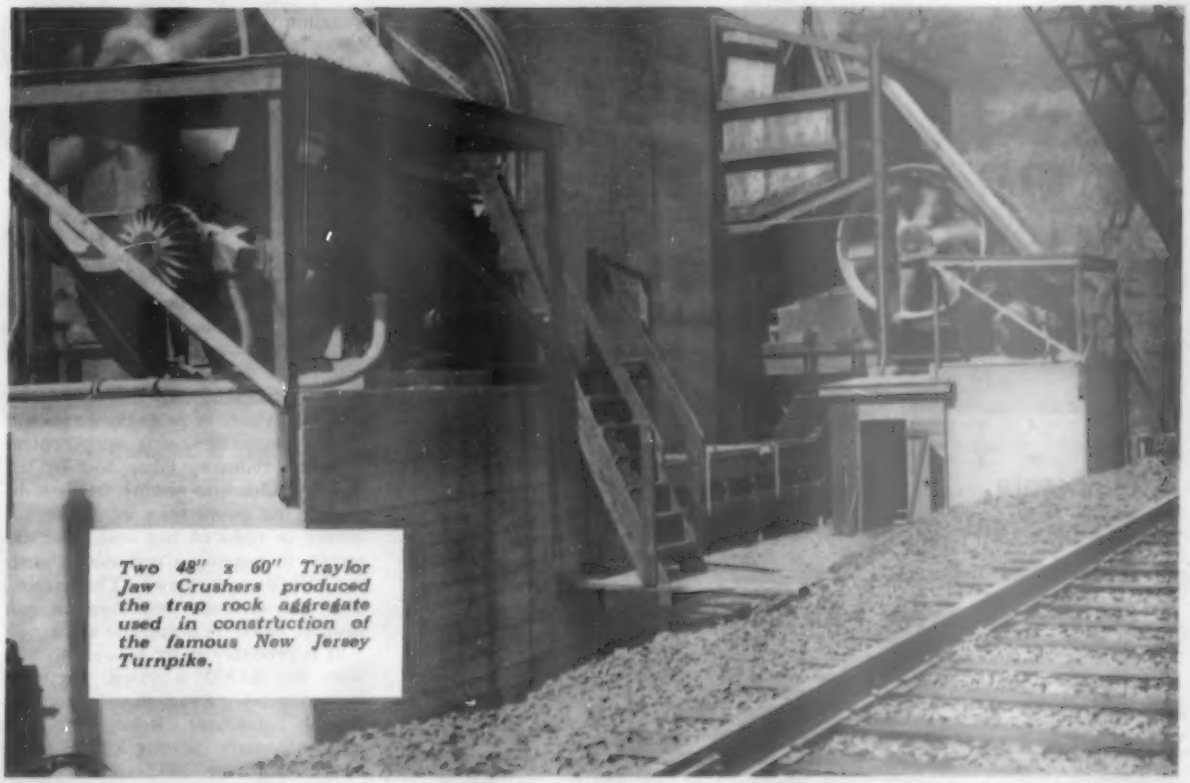
At higher rates the extra labor needed to close the open-mouth bags nearly balances the valve cost. If the difference in cost of the two bags, for instance, is $.007 at a bagging rate of 6/min. the valve bag costs as much to use as the open-mouth unit, Fig. 3. The same applies when the difference is $.0018 and bagging rate is 20/min. It takes careful study to find out which bag is best at high rates. An impartial bag supplier can make such a study.

HOW MUCH MAY BE SAVED BY PUTTING IN AUTOMATIC SEWING. Before considering automatic sewing, you should be sure you are getting the best accuracy and the lowest bag cost.

An important thing to remember is that it is nearly impossible for an automatic sewing device to completely replace a sewing operator. Sewing heads require maintenance. Much of this maintenance is performed at manual installations by the sewing operator. He frequently oils the machine, repairs broken thread, adjusts the sewing head, besides performing general preventive maintenance service.

He is also an inspector; he sees when a thread breaks and holds up

(Continued on page 144)



Two 48" x 60" Traylor Jaw Crushers produced the trap rock aggregate used in construction of the famous New Jersey Turnpike.

TRAYLOR PRIMARY JAW CRUSHERS

Pave the way to Bigger Profits

Production of uniform aggregate to exacting specifications is the job for a Traylor Jaw Crusher. Greater hourly tonnage, a more uniform product, and reduced power costs all combine to pave the way to more profitable aggregate production. For over half a century, Traylor has been building heavy-duty crushing machinery to assure profits under the most severe operating conditions.

For complete details send for a copy of free bulletin on Traylor Primary Jaw Crushers. There are 17 sizes of "Traylor-Made" Jaw Crushers with hourly capacities from 4 to 1,000 tons.

TRAYLOR ENGINEERING & MFG. CO.
715 Mill St., Allentown, Pa.
Canadian Mfrs.: Canadian Vickers, Ltd., Montreal, P. Q.

A Traylor leads to greater profits

SEND FOR BULLETINS
. . . just mention the Traylor Equipment that interests you.

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1-cu. yd. Sauerman Slackline Cableway began operations in 1921

Company expanded output with this 2-cu. yd. Sauerman Slackline Cableway in 1948

Minnesota Gravel Producer Gives the Facts on Recovery with Slackline Cableway

Guaranteed Gravel and Sand Co.'s 2-cu. yd. Sauerman Slackline Cableway, installed in 1948, replaced a similar unit of 1-cu. yd. capacity. Combined service of these two machines adds up to over 33 years company experience in the mechanics and economics of underwater recovery with Sauerman Slackline equipment.

Management of the Minnesota operation believes that a slackline has many definite advantages where the inhaul is long and the material is below water. Faster than other types of equipment, the company capitalizes on the slackline's speed over a maximum inhaul of 700 ft., with an average of 250 to 300 ft. A shift can be made in about an hour, if the material suddenly falls off, and it is possible to recover from depths exceeding 100 ft.

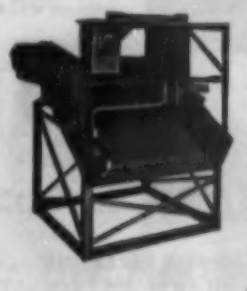
Due to the height from which the material is discharged, the slackline cableway readily lends itself to stockpiling. The surge pile can be built to a height of over 60 ft. This makes it possible to operate during periods when the river end of the plant is idle, thus averting complete shutdown such as might well occur if other types of recovery and stockpiling equipment were used.

The present slackline is operated by a Sauerman Roller Bearing Hoist, driven by a 6-cylinder diesel. The 80-ft. mast is so located that the effective height above water level is approx. 95 ft.

Complete details on the above operation were recently published in a leading aggregates producer publication. For full information contact Sauerman Bros., Inc., and request Catalog C., Slackline Cableways.

SAUERMAN BROS. INC.

630 S. 28th Ave. | BELLWOOD, ILL.



What Couldn't Be Done is Child's Play for the Leahy

It used to be said that you couldn't screen lime, ag-lime or silica sand without frequent stops for tedious and costly cleaning of mesh. But the Leahy Screen with both Differential Vibration and FlexElex heating of the screen jacket, available only in the Leahy, assures non-stop full capacity, accurately sized production day after day at tremendous savings in costs.

Send for Bulletin 15-J

THE DEISTER CONCENTRATOR COMPANY

915 Glasgow Avenue | Fort Wayne 3, Indiana

operation until repairs are made. Where a tape closure is involved, he fingers the top of the bag to make certain that the sewing passes through both the tape and the bag.

With automatic sewing, therefore, maintenance may become a problem. Automatic sewing certainly will not eliminate a full man. A more realistic figure would be "one-half of a man."

It is unlikely that automatic sewing can be had by eliminating one-half man. Based on a figure of $4500 a year, cost for one-half-man amounts to $2250. For a three-year amortization and a 52 percent tax on profit, an investment of only $3300 can be justified, which is probably too small to buy automatic sewing equipment.

Before reducing labor cost by installing automatic sewing, it pays to exploit the possibilities of better accuracy or reduced bag cost. For example, in bagging a commodity costing $.05/lb. at a rate of 12 bags/min., a ½-oz. accuracy improvement will save as much as automatic sewing.

It is probably more feasible to buy with the $3300 a ½-oz. accuracy improvement rather than automatic sewing equipment. Relative to bag cost, automatic sewing could easily require the use of larger bags to facilitate the automatic sewing operation. At 12 bags/min., a bag cost increase of $.0015 would cancel out a $3300 savings provided by automatic sewing.

On the other hand, where accuracy and bag cost are at the optimum and where speeds of say 20/min. and a three-shift operation is involved labor reduction could provide a saving. If two 2-man systems are required without automatic sewing, a saving of 2½-men on each shift is possible.

This saving would amount to $33,750 per year. It would justify an investment of about $53,000 on the basis of 3-year amortization and a 52 percent tax. Significantly, if the tonnage is high, automatic sewing can be important.

Firm Pays For Ideas

American Cyanamid Co. recently presented checks totaling $1200 to two employes at its Tampa, Fla., phosphate processing plant, for ideas adopted through the company's suggestion system. Horace P. Gill of Bradley, Fla., received $650 for his suggestion for an improved method of removing large stone which may block the pumps. John B. Ballard of Lakeland, Fla., was awarded $550 for his suggestion regarding land-clearing operations ahead of actual mining. The company has paid more than $280,000 for workable ideas to its employes since the plan was started in 1951.

BAY CITY handles one of the world's heaviest ores for GENERAL REFRACTORIES CO.

This BAY CITY Model 45 is unloading and stockpiling heavy chrome ore at a railroad siding for General Refractories Co.

The chrome ore known as chromite or chromic iron, used by General Refractories Company of Curtis Bay, Maryland, in the manufacture of fire brick for steel furnaces, comes from mines in remote sections of the Philippine Islands. Weighing approximately 220 lbs. per cubic foot, it is almost as heavy as lead ore. Yet a BAY CITY Model 45 Crane handles this ore, one of the world's heaviest, with relative ease. This powerful, efficient machine, operating with an Owens "M" bucket, unloads and stockpiles chromite for General Refractories Company at an exceedingly fast rate.

BAY CITY Cranes are ruggedly built for high daily production and long, dependable service on difficult materials handling operations. They have a powerful Diesel engine, one piece cast alloy steel bases, long, wide crawlers, tandem drums in ball bearings, power booster clutches, helical cut gears and many other advanced design features that help insure time-saving, money-saving operation. Every BAY CITY is engineered for accurate balance, easy operation and low cost maintenance. For complete details, consult your nearest BAY CITY dealer.

Write for any of these catalogs describing BAY CITY *Crawlers of ½ yards and up or* BAY CITY *CraneMobiles and CraneWagons in capacities to 25 tons.*

BAY CITY

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN 247

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

Pennsylvania Agricultural Limestone Producers Boost Promotion Program

• Agricultural Limestone Division, Pennsylvania Stone Producers Association, annual meeting suggests that more small acreage farmers enter the ASC liming program

SOME VERY LIVELY DISCUSSION and action took place at the annual meeting of the Agricultural Limestone Division, Pennsylvania Stone Producers Association annual meeting at the Hotel Penn-Harris, Harrisburg, Penn., on December 21.

Chairman Leonard Fry presented his report of the division's activities at the business meeting in the morning, and reviewed the various meetings which the board of directors held with the Agricultural Soil Conservation Committee regarding regulations which govern soil conservation practices. He also told about the Vo-Ag Teachers Conference, the development and distribution of soil judging scorecards for use by Vo-Ag teachers and students, and the division's annual scholarship awards for Vo-Ag students at Pennsylvania State University.

Dean Fyock, division representative in charge of the display booth at the annual Vocational-Agricultural Teachers Conference, held at Eagles Mere, Penn., on June 15 to 18, described the lime meter, the soil sampling devices, soil kits and free booklets on the application and use of agricultural limestone which were on display. More than 300 teachers were in attendance. It was decided to continue this display in 1955. Robt. Garman, president of the Pennsylvania Stone Producers Association, reported on the scholarship awards to worthy Vo-Ag students at the university.

Secretary H. H. Wagner pointed out that from all information available, sales of agricultural liming material in Pennsylvania were 30 percent lower for 1954 than 1953. This is the second year in which annual sales have taken a drop. He also predicted that sales in 1955 would be very much lower than either of the previous years, due to cross-compliance regulations which would control farmer participation. Thos. Lalley, of Binkley Bros., Inc., presented the report of Treasurer H. M. Binkley.

The following officers were elected: chairman, F. Edward George, Thomasville Stone & Lime Co.; vice-chairman, D. K. Shroyer, H. E. Millard Lime & Stone Co.; treasurer, H. M. Binkley, Binkley Bros., Inc.; secretary, H. H. Wagner, also general manager of Pennsylvania Stone Producers Association. Elected to the board of directors were: eastern section, Ivan M. Martin, Ivan M. Martin, Inc., and Fred Roberts, Evans-Roberts, Inc.; central section, W. O. Faylor, Faylor Lime & Stone Co., and C. E. Peterson, Pine Creek Lime & Stone Co.; western section, Robert Hammett, The Carbon Limestone Co., and Herschel W. Lamb, Grove City Limestone Co.

The open annual meeting was reconvened in the afternoon with Ralph Culver, state chairman of the ASC committee and H. H. Wagner, secretary of the Agricultural Limestone Division, serving as co-chairmen.

Newly elected chairman, F. Edward George, offered a resolution of thanks, which was unanimously carried, expressing appreciation for past chairman Leonard Fry's efforts in behalf of the division.

Ralph Culver gave a comparative analysis of the total acres of available farming land in Pennsylvania, New York and Ohio, and the total tonnage of liming materials used by the respective states from 1936 to the present. These figures showed that since 1936, Pennsylvania with 14 million acres available for farming, used 15.6 million tons of liming material; New York with 16 million acres applied 9.8 million tons; and Ohio with 21 million acres, applied 21 million tons. Figures for 1952, 1953 and 1954 show that in Pennsylvania, the application of liming materials for the successive years was one million tons, .8 million tons, and .75 million tons; for New York it was .8 million tons, .5 million tons, and .5 million tons; for Ohio it was 2 million tons, 1.5 million tons, and one million tons.

Anthony DiSanto, program specialist for the Pennsylvania ASC Committee, explained the 1955 program, and pointed out that 21 counties in the state would be under the contract plan, and the remaining 46 counties would be under the purchase order plan. In 1953, 86,240 farmers were enrolled under the program; in 1954, 56,000 were enrolled.

Mark Shuman, administrative director for the state ASC committee said that $3,800,000 was available for conservation practices in Pennsylvania for 1954. The amount available for 1955 will be $4,157,000, and farmers are being enrolled for this program.

Frank G. Bamer, agronomist for Agricultural Extension Service, gave some significant figures. From the years 1925 to 1933, inclusive, Pennsylvania used a total of 289,717 tons of agricultural limestone. In the single year of 1933, 156,000 tons were used. In 1936, the figure had grown to 300,000 tons; in the year 1952, 1,150,000 tons were delivered to Pennsylvania farmers.

Dr. R. P. Pennington, assistant professor of soil technology, who substituted for A. C. Richer, professor of agronomy of Pennsylvania State University, discussed the experimental work on liming by the university. He pointed out that good soils consisted of 25 percent air space, 25 percent moisture and 50 percent solids. He suggested that sub-soiling is the only way to increase our productive acreage. Dr. Pennington said that there is revised thinking on pH requirements for certain crops. Potatoes were generally considered to develop scabs when the pH was 6.5 or 7, but the agronomist's experiments today indicate a pH of 8 or higher for potato land would be suitable. This, it is believed, will produce more potatoes to the acre, eliminate scabbing condition, and condition the soil for a crop of green manure.

Norman K. Hoover, of the department of Agricultural Education of Penn State University, explained the function of the Land Use and Management Scoreboard which has been made available to all Vo-Ag teachers and students by members of the Agricultural Limestone Division. H. C. Fetterolf, Chief, Agricultural Education, Pennsylvania Department of Public Instruction, explained the purpose of holding the annual Vo-Ag Teachers Conference.

Chairman F. Edward George asked the Pennsylvania ASC committee members what plans they had made for encouraging greater farmer participation in 1955. Chairman Culver, representing ASC, replied that in the light of

(Continued on page 148)

comparative figures submitted by the state committee, Pennsylvania had done very well and there were no immediate plans for changing the program. D. K. Shroyer, vice-chairman of the Agricultural Limestone Division, replied that, based on farmer participation figures, he did not believe that the state committee had discharged its duty and moral obligation to get full farmer participation in conservation practices. He pointed out that the land which needed conservation most; that is, the small farmer with the marginal lands, was the one who was not presently taking part in the program. He said that there were two reasons for this; (1) the small farmer could not afford to take off the time to make the necessary trips to the county office to get signed up for the program, and (2) that the lifting, preparing and delivering of soil samples was a task which he would not carry out and therefore was eliminated from the program. After considerable discussion, Chairman Culver suggested that the division prepare a formal statement covering this subject. Chairman F. Edward George appointed a committee for this purpose, and the meeting adjourned.

Agstone Consumption

AGRICULTURAL LIMESTONE CONSUMPTION decreased over 6,300,000 tons or 24 percent during 1953, compared to the previous year, as reported by the National Lime Association. The 1953 figure was the lowest since 1943, and was said to be due to three prime factors: the tonnage of liming materials sold with federal subsidy assistance was 33 percent lower in 1953 than in the previous year; severe drought conditions, and the slight drop in net income of the farmer below 1952. However, the largest percentage of lime purchased without federal subsidies since 1941, was achieved in 1953, and the consumption of lime decreases less in proportion than total subsidies, despite the other two adverse conditions. This is said to indicate that the farmers' appreciation of the value of lime is growing.

Opens Crushed Stone Plant

PENNINGTON - WINTERS CONSTRUCTION CO. of Oklahoma City, Okla., has started operation at a crushed stone plant, costing approximately $200,000, at Cliburn Bluff near Antoine, Ark. The plant produces about 20 freight cars of rip-rap daily.

Gypsum Plant Expansion

CERTAIN-TEED PRODUCTS CO., Ardmore, Penn., recently announced a $100,000 expansion and improvement program at its Acme gypsum plant near Fort Worth, Texas.

MODEL 20-S

20-ton end dump truck—120" wheelbase. Powered by 225 HP Diesel Engine with or without torque converter. 70,000 lb. Dart planetary rear axle with 20" x 9" air brakes—20,000 lb. front axle with 17¼" x 4" air brakes—14:00 x 24, 20-ply front tires—16:00 x 24, 24-ply rear tires. Hydraulic steering—13 cubic yard R/Q body. Approximate weight, 35,000 lbs.

MODEL 300/747—45-ton crane carrier—220" wheelbase. Powered by 200 to 250 HP Gasoline or Diesel Engine with 5-speed transmission and 2-speed auxiliary transmission. 25,000 lb. front axle with 20¼" x 5" air brakes—90,000 lb. tandem rear axles with 20¼" x 7" air brakes—(10) 14:00 x 24, 20-ply tires all around. Hydraulic steering. Approximate weight of chassis, 50,000 lbs. Other models available.

MODEL 15DT—Chassis for 7-7½ cubic yard mixer—138" wheelbase. Powered by 165 HP Gasoline Engine with 5-speed transmission and 3-speed auxiliary transmission. 22,000 lb. tandem front axles with 17¼" x 3" air brakes—28,000 lb. tandem rear axles with 16" x 5½" air brakes—(12) 10:00 x 22, 12-ply tires all around. Approximate weight of chassis, 14,000 lbs.

MODEL 55TA—55-ton end dump truck—211" wheelbase. Powered by two 300 HP Diesel Engines with torque converters. 200,000 lb. Dart planetary drive tandem rear axles with 20" x 9" air brakes—50,000 lb. front axle suspended with a hydraulic air strut with 20" x 9" air brakes. Steering by hydraulic power on a center bearing cushioned by captive air in hydraulic air strut. 18:00 x 25, 32-ply tires all around—30 cubic yard rock body. Approximate weight, 96,000 lbs.

MODEL 10-S—10-ton end dump—106" wheelbase. Powered by 156 HP Diesel Engine—14,000 lb. front axle with 17¼" x 3" air brakes—26,000 lb. full floating double reduction rear axle with 16½" x 7" air brakes—12:00 x 20, 16-ply tires all around. Hydraulic steering—6½ cubic yard R/Q body. Approximate weight, 20,000 lbs.

MODEL 30-SL—30-ton end dump truck. Full cab. 186" wheelbase. Powered by 300 to 350 HP Diesel Engine with or without torque converter. 100,000 lb. Dart planetary rear axle with 20" x 9" air brakes. 25,000 lb. front axle with 20¼" x 5" air brakes. 14:00 x 24, 28-ply front tires (16:00 x 25, 24-ply optional)—18:00 x 25, 32-ply rear tires. Hydraulic steering—25 cubic yard Rock body. Approximate weight, 46,000 lbs.

MODEL 35SA—35-ton end dump truck—169" wheelbase. Powered by 300 to 400 HP Diesel Engine with Torque converter. 100,000 lb. Dart planetary rear axle with 20" x 9" air brakes—50,000 lb. front axle suspended with a hydraulic air strut with 20" x 9" air brakes. Steering by hydraulic power on a center bearing cushioned by captive air in hydraulic air strut. 18:00 x 25, 32-ply tires all around—24 cubic yard Rock body. Approximate weight, 82,000 lbs.

MODEL 15S-BDT—15 cubic yard bottom dump truck—100" wheelbase (tractor), 70,000 lb. Dart trailer axle with 20" x 9" air brakes. Hydraulic or cable operated doors. Front tires, 13:00 x 24. Rear tractor and trailer tires, 24:00 x 25. Approximate weight of tractor-trailer, 40,000 lbs.

MODEL 200/456—25-ton crane carrier—186" wheelbase. Powered by 150 to 200 HP Gasoline or Diesel Engines with 5-speed transmission and 2-speed auxiliary transmission. 14,000 lb. front axle with (optional) 17¼" x 3" air brakes. 50,000 lb. tandem rear axles with 16½" x 7" air brakes. (10) 11:00 x 20, 12-ply tires all around. Hydraulic steering (optional). Approximate weight of chassis 26,500 lbs. Other models available.

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For over 52 years, DART has engineered and built trucks for heavy-duty, off-highway haulage. In the progression of years, many important improvements and a long series of DART "Firsts" have resulted. Exclusive features in DART TRUCKS may save time and money on your job. DART engineers may have the answer to your particular truck haulage problem.

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SUBSIDIARY OF THE CARLISLE CORPORATION

MANUFACTURERS NEWS

Bucyrus-Erie Co., South Milwaukee, Wis., has announced the retirement of R. C. Woodward as chief metallurgist and consulting metallurgist for the company but will offer part time service as a consultant in cable tool drilling problems through Bucyrus-Erie Co. or at 3499 N. Murray Ave., Milwaukee 11, Wis. Mr. Woodward was the originator of the lightweight cast steel tool wrench, which has been adopted by most manufacturers of churn drilling tools. He was the first to use alloy steel for blast hole drill bits.

LeTourneau-Westinghouse Co., Peoria, Ill., has purchased the plant and assets of the J. D. Adams Mfg. Co., Indianapolis, Ind. Howard R. Meeker, president of Adams, has been named board chairman of LeTourneau-Westinghouse; Merle Yontz continues as president; Floyd D. Wallace of Adams, becomes director and vice-president and general manager in charge of manufacturing operations in Indianapolis. W. W. White of Adams, serves as consultant, and Morris L. Brown of Adams, becomes a director and assistant secretary.

International Harvester Co., Chicago, Ill., has announced the following transfers and appointments: J. O. Lambeth, district manager, Nashville, Tenn.; C. T. Helis, district manager, Charlotte, N. C.; P. C. Johnson, district manager, Birmingham, Ala.; J. S. Turner, district manager, Houston, Texas; H. T. Rosell, district manager, San Antonio, Texas; Hugh Hanks, assistant district manager, Omaha, Neb.; and J. M. Coyle, assistant district manager, Lincoln, Neb.

Westinghouse Air Brake Co., New York, N. Y., has announced the appointment of Paul I. Birchard as vice-president and general manager of the Le Roi division in Milwaukee, Wis. He succeeds Edward J. Green, who has been temporary general manager since the resignation of T. O. Liebscher, former president of Le Roi Co. Mr. Green has returned to Pittsburgh to resume his position as executive assistant to Edward O. Boshell, president of Westinghouse Air Brake Co.

Vertical Turbine Pump Association, Los Angeles, Calif., has elected the following officers to serve during 1955: Warren L. Bremer, vice-president, Layne & Bowler Pump Co., Los Angeles, Calif., president; William H. Reeves, vice-president, Layne & Bowler, Inc., Memphis, Tenn., vice-president; and B. A. Tucker, sales manager, Peerless Pump Division, Food Machinery & Chemical Corp., Los Angeles, Calif., secretary-treasurer. H. D. Voe Rea is executive manager of the association.

Federal Motor Truck Co., Detroit, Mich., has been purchased by a Minneapolis group connected with Northwestern Auto Parts Co. and will resume manufacturing operations at the Detroit plant. Officers of the new company, a Minnesota corporation, are Max Rappaport, president; James Rappaport, secretary; M. J. McCarty, executive vice-president; and Fred Rappaport, treasurer.

H. K. Porter Co., Inc., New York, N. Y., has announced the appointment of G. F. Ryan as sales manager of the New York district of Loschen wire rope division in New York, New England, New Jersey, Maryland and eastern Pennsylvania.

Thew Shovel Co., Lorain, Ohio, announces that E. C. Breidbaum has been appointed assistant to the general manager. He joined the company in 1952 as director of methods after 17 years with Harnischfeger Corp., Milwaukee, Wis.

White Motor Co., Cleveland, Ohio, announces the election of Henry J. Nave as president of the White Motor Co. of Canada, Ltd., to succeed L. M. Hart, who continues as a director of the

Check the looks!

Ice, Sleet, Snow—**SLOW!**

Try the comfort!

Then, to get the most for your money

LOOK UNDER THE HOOD!

A revolution in truck power is taking place . . . sparked by the Ford Short-Stroke V-8!

When a new type of engine prolongs piston ring life as much as 53% . . . gives gas savings of up to 1 gallon in 7 . . . cuts engine friction as much as 33% to liberate more *usable hauling power*, you know it's bound to go over big with economy-minded truck users.

A new MONEY MAKER **for sand and gravel delivery—the '55 Ford T-800 Tandem Axle Big Jon! Powered by the mighty Short-Stroke 170-h.p. *Cargo King* V-8, it is rated for 40,000 lbs. GVW, 60,000 lbs. GCW. *Master-Guide* Power Steering is standard equipment!**

Small wonder, then, that the truck industry is now investing millions of dollars *under the hood* . . . in a revolutionary switch to Short-Stroke V-8's.

But Ford, pioneer in V-8 truck power, made the switch over three years ago. And right *now*, you'll find a *proven*, modern Short-Stroke engine under the hood of every Ford Truck. Only Ford offers a full line of Short-Stroke engines . . . four V-8's and a Six.

Make sure your next truck is a modern Money Maker. Look *under the hood!* Look for a modern Short-Stroke engine with a "stroke" as short as, or shorter than its "bore." And remember, you get the full advantages of Short-Stroke design *today* in any Ford Truck you choose.

Call your Ford Dealer or write: Ford Division, Ford Motor Co., Dept. T-13, Box 658, Dearborn, Mich.

FORD Triple Economy TRUCKS

THE MONEY MAKERS FOR '55

Canadian subsidiary. Karl A. Roesch, assistant to the vice-president in charge of sales, has been named to succeed Mr. Nave as director of service.

Electric Steel Foundry Co., Portland, Ore., has appointed R. W. de Weese as vice-president in charge of sales, and Jefferson J. Davis as

Jefferson J. Davis

R. W. deWeese

vice-president in charge of product divisions. Mr. de Weese has been with the company for 14 years and was formerly manager of the metallurgical and inspection departments. Mr. Davis joined the company in 1936 and was manager of the construction equipment division prior to his appointment.

Joy Mfg. Co., Pittsburg, Penn., has announced the appointment of H. B. Zeppenfeld as sales manager of the electrical connector division. He was formerly industrial sales manager for the division. R. G. Gehlsen, who has been largely responsible for development of many Joy products, including the safety circuit center with its intrinsically safe control circuit, has been made manager of electrical connector products.

American Brake Shoe Co., New York, N. Y., announces the election of Cyrus E. Brush as vice-president. He was formerly secretary and will be succeeded by Alfred H. Munkenbeck, Jr., who will be replaced as assistant secretary by William J. Foster, III.

American Steel Dredge Co., Inc., Fort Wayne, Ind., announces that the Wayne crane division has been changed to the Wayne shovel and crane division.

Gar Wood Industries, Inc., Wayne, Mich., has appointed Leo M. Brown as assistant to the director of sales and advertising. He was formerly sales manager of the St. Paul hydraulic hoist division.

American Brake Shoe Co., New York, N. Y., announces that S. Whitney Dickey has been appointed assistant vice-president of the brake shoe and castings division. He was formerly eastern district sales manager for the division.

Cleveland Worm & Gear Co., Cleveland, Ohio, has announced the appointment of Ralph E. Dittoe as sales manager of the worm gear division in addition to his duties as assistant secretary of the company, of which he is also a director.

Gardner-Denver Co., Quincy, Ill., announces that A. G. Lindquist has been elected vice-president in addition to his duties as secretary and comptroller.

Caterpillar Tractor Co., Peoria, Ill., has elected Charles A. Woodley as a vice-president, and Lloyd J. Ely as manager of the Peoria plant.

Nordberg Mfg. Co., Milwaukee, Wis., announces production of the 5000th Symons cone crusher for the mining and quarrying industries. Crusher No. 5000 is one of 37 ordered to date by iron ore producers in the Lake Superior iron ore region to process taconite.

Eaton Mfg. Co., Cleveland, Ohio, announces acquisition of the plant and office space of the Bryant heater division of affiliated Gas Equipment, Inc., which will now be occupied by the stamping division, while the axle division will

Saves big shovels for shovel-rated jobs

At this Lannon-stone quarry, Lannon, Wis., Minneapolis-Moline RTI Wheelers remove overburden to release expensive shovels for bigger shovel-rated jobs. Result: Wheelers match production, cut operating costs, free shovels to remove heavy stone slabs locked deep in the earth.

With its high-strength construction from radiator to drawbar, front axle conservatively rated at 5000 lbs., greater maneuverability, lower cost per weight and power, the RTI removes spoil at far less cost than would ever be possible with heavier, more expensive equipment.

This is the kind of a job where extra MM quality really pays off. Heaviest industrial-type engines, clutches and transmissions offer continuous-duty operation at full-rated power. The extra weight and rigid single unit design of MM RTI Wheeler loaders permit maximum digging and crowding performance.

If you are using big equipment where the low-cost MM Wheeler could save you money, contact your MM dealer-distributor at once. Let him show you why MM Wheelers just can't be matched for performance, for capacity, for money saved.

Whenever you compare MM Wheelers with any industrial tractor, be sure to compare the clutch. The 14" UTIL Wheeler clutch is rated at 640 torque-pounds-foot, while the engine develops 233 torque-pounds-foot at 1060 rpm. This load ratio is typical of the performance reserve you get when you buy a Wheeler.

MINNEAPOLIS-MOLINE MINNEAPOLIS 1, MINNESOTA

Way up and way out! Rigid construction and extra weight of both 30 hp. RTI and 57 hp. UTIL Wheelers permit solid frame for greater lifting weight, longer dumping reach.

Forget tight spots. With this high-reach, side-dump-loader bucket, you can operate in closest quarters, cut maneuvering to an absolute minimum.

Complete line of loader attachments makes Wheelers pay on every job. The right attachments handle loose, bulk or palletized material with equal economy.

utilize the space formerly occupied by the stamping plant. Possession of the title will be acquired March 1 and complete possession April 1, with full operation scheduled for August 1.

George Haiss Mfg. Co., Inc., New York, N. Y., subsidiary of Pettibone Mulliken Corp., Chicago, Ill., has appointed Southern Machinery & Supply Co., Roanoke, Va., as distributor in the state of Virginia.

A. P. Green Fire Brick Co., Mexico, Mo., has announced the appointment of James J. Offutt as manager of domestic and Canadian affiliate companies. W. G. Twyman, who formerly managed A. P. Green Fire Brick Co. of Michigan, succeeds Mr. Offutt as general manager of A. P. Green Fire Brick Co., Ltd.

Goodall Rubber Co. and its subsidiary, Whitehead Bros. Rubber Co., Trenton, N. J., have merged, with Goodall serving as the parent organization and Whitehead Bros. Rubber Co. as the Whitehead rubber division of Goodall Rubber Co.

Sierra Industrial Instrument Co., San Francisco, Calif., has announced the sale of its Dens-O-Meter to the Halliburton Oil Well Cementing Co., Duncan, Okla. The deal included equipment, business and patent holdings.

Bucyrus-Erie Co., South Milwaukee, Wis., announces that Robert P. Brooks has been appointed sales manager in Washington, Oregon, Idaho, Montana, Alaska, the provinces of British Columbia and Alberta, and the Yukon territory, with headquarters in Seattle, Wash.

Chain Belt Co., Milwaukee, Wis., announces the appointment of William J. Sparling to the board of directors, replacing the late William C. Frye, in addition to his duties as vice-president and manager of the Milwaukee operations. Bernard Schneider, who has had 30 years of experience in conveyor engineering work, has been promoted to chief engineer for the conveyor equipment section.

Hendrick Mfg. Co., Carbondale, Penn., announces that E. Donald Schreckengost has been appointed sales engineer for Hendrick perforated metal screens, wedge slot and wedge wire. He was formerly preparation manager for the Freeport Corp.

United States Rubber Co., New York, N. Y., announces that Matthew J. Delehaunty has been named manager of mechanical goods sales for the mechanical goods division. He was formerly manager of commodity sales.

Le Roi Division, Westinghouse Air Brake Co., Milwaukee, Wis., has named Don S. Permar as field sales manager. He was formerly sales manager of stationary air compressors.

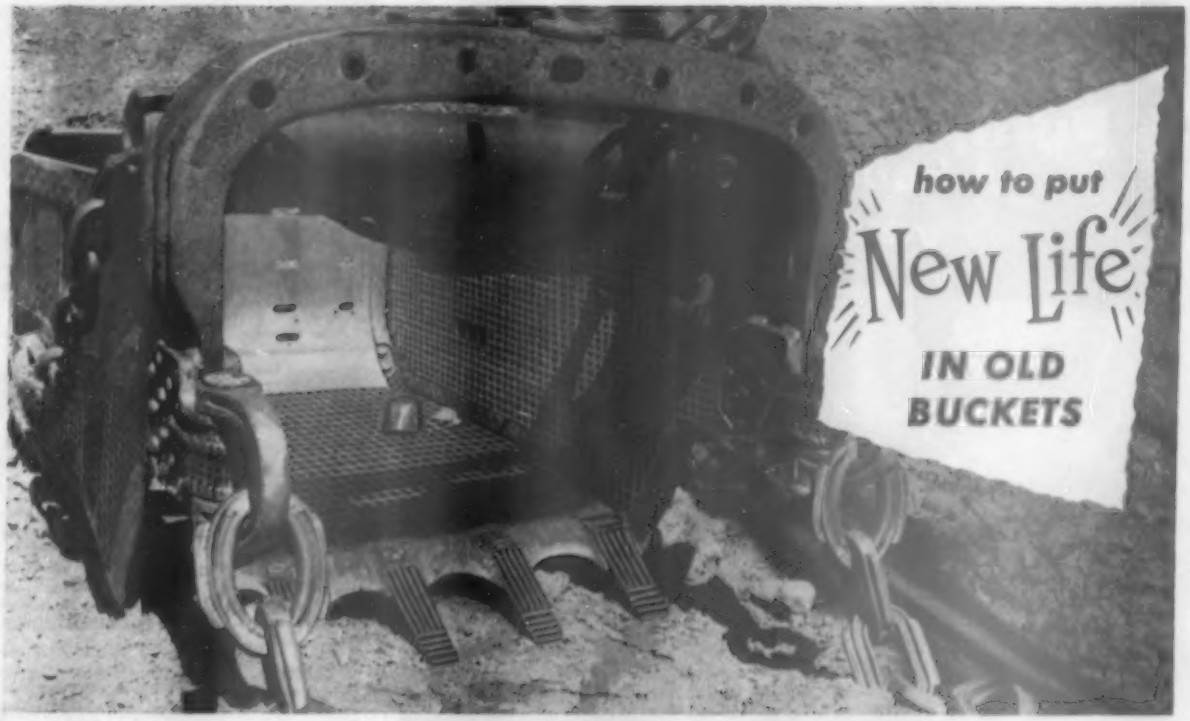
Hammond Bag & Paper Co., Wellsburg, W. Va., has appointed Kenneth F. Rupp as sales representative in southern Indiana and Kentucky, with headquarters in Middletown, Ohio.

The Rubberoid Co., New York, N.Y., producer of asbestos-cement building materials, plans construction of a new plant in Los Angeles, Calif.

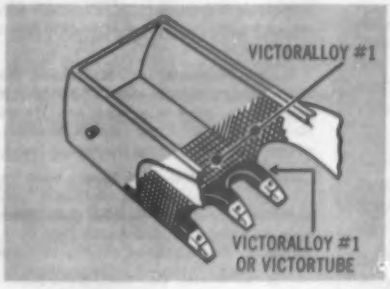
Eaton Mfg. Co., Cleveland, Ohio, has announced the appointment of R. C. Ochs as assistant general manager of the axle division. A graduate of Cornell University with a B.S. degree in mechanical engineering, Mr. Ochs was formerly assistant to the general manager.

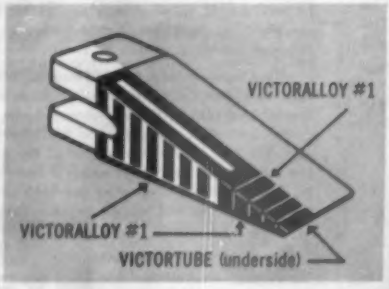
Syntron Co., Homer City, Penn., announces the appointment of Gilbert Hilbrant and R. B. Dietsche to the sales staff of the Syntron Chicago Sales Co., Chicago, Ill.

W. E. Dunn Mfg. Co., Holland, Mich., has acquired control of Concrete Equipment Co., sponsors of the Champion drain tile machines



USE VICTOR HARDFACING





Buckets . . . Apply VICTORALLOY #1 to top and bottom of bucket lips in overlapping beads. Protect other parts or areas showing wear with stringer beads of VICTORALLOY #1. Use 3/16" coated VICTORALLOY #1 at 170 to 190 amperes, a.c. or d.c., or ¼" at 200 to 225 amperes. If wear is unusually severe, substitute VICTORITE on bucket lips; use 3/16" coated at 120 to 150 amperes, a.c. or reverse-polarity d.c.

Teeth . . . Apply VICTORTUBE to underside from point upward about 2", and VICTORALLOY #1 to upper side of tooth same distance. Use stringer beads of VICTORALLOY #1 on balance of upper and lower surfaces, and on edges. Use 3/16" coated VICTORTUBE at 130 to 160 amperes, a.c. or reverse-polarity d.c., and 3/16" coated VICTORALLOY at 170 to 190 amperes, a.c. or d.c.

Why guess? . . . Select the right alloy from VICTOR's complete hardfacing line, made for both gas and manual or automatic arc application. New VICTOR illustrated hardfacing manual tells which alloys to use, how to apply. Ask your VICTOR dealer or write us today for your free copy.

Profitable dealerships open; inquire now!

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VICTOR EQUIPMENT COMPANY

ALLOY ROD & METAL DIVISION

Mfrs. of welding & cutting equipment; hardfacing rods; blasting nozzles.

10-H

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and Korpak block machines. It is announced that the change will not affect the interests of owners of Champion and Korpak equipment, but that W. E. Dunn will render direct service to machines already in the field, and undertake the merchandising of the equipment from now on.

The Babcock & Wilcox Co., New York, N.Y., has acquired the assets and business of the Globe Steel Tubes Co., Milwaukee, Wis., which will now become a part of the company's tubular products division, Beaver Falls, Penn., under Edward A. Livingstone, vice-president. Glen H. Rearick, formerly in charge of the Alliance, Ohio, plant of the division, has been placed in charge of the Milwaukee plant.

Atlas Powder Co., Wilmington, Del., has announced consolidation of the New York and Tamaqua, Penn., explosive sales districts into the eastern district, with James R. Russell, Morristown, N. J., as manager. W. C. Manning, assistant director of sales, will handle specialized sales problems in the New York area, and A. F. Hutcheson will continue as resident manager of the Tamaqua office.

General Dynamics Corp., Bayonne, N. J., announces that Robert Hoffman has been named western regional manager for the electro dynamic motor-generator division. A graduate of Stevens Institute of Technology, Hoboken, N. J., Mr. Hoffman's experience in electric motors includes seven years as a salesman and district sales manager.

Fibrico Co., Chicago, Ill., announces the appointment of W. H. Borchers as sales engineer in the Chicago area. He succeeds Graeme Pieters who has been transferred to national accounts. R. A. McMillan has been named sales engineer in the Pensacola, Fla., area. He was formerly sales engineer in the northern Illinois area and will be succeeded by L. H. Andersen. A. W. Peterson and R. L. Turnbull have joined the sales engineering staff.

Builders Equipment Co., Phoenix, Ariz., has moved its offices in Phoenix to 3810 North Central Avenue.

Stearns Magnetic, Inc., Milwaukee, Wis., has announced the appointment of David F. Christnelly as assistant sales manager. He was formerly a member of the sales department and a production expediter in the transmission plant.

Colorado Fuel & Iron Corp., New York, N. Y., announces that A. H. Zellinger, safety superintendent at the Pueblo, Colo., plant, has been awarded the National Safety Council Citation for Distinguished Service to Safety.

H. K. Porter Co., Inc., New York, N. Y., announces the purchase of the Riverside Metal Co., Riverside, N. J., manufacturers of nonferrous metals. New officers are T. M. Evans, president; C. R. Dobson, vice-president; F. A. Rehorst, secretary, and J. C. Leslie, treasurer.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced the appointment of G. V. Woody as special assistant to C. W. Schweers, vice-president, director of sales, general machinery division. He was formerly manager of the processing machinery department and will be succeeded by William M. Wallace who has been assistant to the vice-president of the general machinery division.

Dow Chemical Co., Midland, Mich., announces that Dr. F. C. Peterson has been appointed director of industrial relations, succeeding Luther Evans who has been named assistant general manager of the Texas division.

Harnischfeger Corp., Chicago, Ill., announces that the shovel division formerly called the P&H small excavator division is now to be the P&H power crane and shovel division, and that the division in charge of all electric machine sales is to be known as the P&H electric shovel division. J. F. Catalane continues to head the

HOW TO BUY CONVEYOR BELTS

and get...
MORE USE PER DOLLAR
where
SPECIAL ENGINEERING
is needed

Look for a make of belt backed by experienced, specialized engineering service.

Selecting the right conveyor belt to solve a special problem begins with selecting the right representative . . . one who will take interest in your particular belt needs and refer your problems to his factory if engineering help is required. Where a company makes a wide selection of conveyor belts for many applications, the representative can often recommend a feature construction to meet your job requirements. Where your problem is unique, that company backs its field men with custom engineering and comes up with a recommendation to meet your specific operating conditions.

Choose the company that offers *complete* belt engineering service . . . the source of supply that maintains close contact between factory and field.

RAYBESTOS-MANHATTAN CONVEYOR BELT ENGINEERING

A leading steel mill, faced with handling hot sintered ore without an insulating layer of "fines", had numerous belt failures due to charring.

An R/M representative called in a factory engineer. A new custom-engineered R/M conveyor belt with special cover now saves hundreds of dollars a year at the mill.

and . . . where hot ash and clinker was wearing out a conveyor belt every month at a Michigan cement plant, an R/M field man was able to furnish a specially engineered Homocord Belt which has outlived the best previous belt four times over.

and . . . special, "chevron cleated" conveyor belt was developed by R/M, as a result of a field representative request, to replace a smooth surfaced belt unable to carry wet iron ore up a mine slope without costly spillage.

These are just a few of many instances where R/M engineering service has solved conveyor belt problems. In other cases, special job requirements have been met with R/M's exclusive constructions such as extra-flexible Ray-Man "F" . . . extra-cushioned Homocord for shock-loading . . . and Ray-Man Tension-Master for extra-high tensions and long lifts.

Let an R/M representative show you why R/M engineering makes R/M Conveyor Belts last much longer . . . give you "More Use per Dollar".

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

power crane and shovel division, and W. E. Hawkinson, *Jr.*, continues as manager of the electric shovel division.

Hercules Motors Corp., Canton, Ohio, has opened a new factory branch in Jacksonville, Fla., to serve Florida, Alabama, Georgia and South Carolina. John C. Poulton is branch manager.

Hyster Co., Portland, Ore., announces availability of a 12-min. 16 mm. color-sound movie, "Design for Excavating," showing the versatility and quick convertibility of the Hystaway to a shovel, backhoe, dragline, clamshell, crane, pile driver and bulldozer.

Reed Blow Pipe Mfg. Co. has moved from San Francisco, Calif., to 2929 Fifth St. in Berkeley, Calif.

The Foxboro Co., Foxboro, Mass., has opened a new instrument service and assembly building in San Leandro, Calif., which, it is claimed, more than doubles the company's West Coast manufacturing facilities.

Caterpillar Tractor Co., Peoria, Ill., has released a new 20½-min. sound-color film on highway safety, "The Perfect Crime," which is presented with the cooperation of the National Safety Council's construction section and members of the Associated General Contractors of America.

Westinghouse Air Brake Co., Pittsburgh, Penn., announces the appointment of Charles J. Haring as director of equipment sales. He was formerly general sales manager of J. D. Adams Mfg. Co., Indianapolis, Ind.

Raymond Bag Co., Middletown, Ohio, has appointed Matthew F. Keane as sales representative in northern Ohio and northwestern Pennsylvania, with headquarters in Cleveland, Ohio.

Hauck Mfg. Co., Brooklyn, N. Y., announces the appointment of Leonard J. Sherek as engineer and district representative for the Detroit territory.

Bailey Meter Co., Cleveland, Ohio, announces that C. D. Shanks has been appointed a resident engineer for southern West Virginia and western Virginia, with headquarters in Charleston, W. Va.

Eagle Crusher Co., Galion, Ohio, has been sold to Joseph Horshow and Associate, Columbus, Ohio, according to an announcement by Clarence L. Wood, retiring president of Eagle Crusher Co. Resigning from the firm after selling their stock are A. F. Unekrich, vice-president; Horace Place, secretary-treasurer; L. E. Place and C. F. Boyd, directors. Robert Wood remains as sales manager.

General Dynamics Corp., Bayonne, N. J., has named Jack Wyatt as district manager of the Detroit, Mich., area of the electro dynamic division.

At Palisades Dam . . .

Belt reinforced with Du Pont "Cordura" still in top condition after 14 months' hard service

Reinforced with Du Pont "Cordura," this 15% slope belt hugs the idler for better troughing and training throughout its run.

Palisades Contractors, Palisades, Idaho, put the conveyor belt shown above through rugged 96-hour work weeks for 14 months—and it's still going strong.

The belt, reinforced with Du Pont Cordura® High Tenacity Rayon, carries 530 yards of earth per hour when in steady operation . . . can handle up to 1,800 tons per hour of large and small rocks, some up to 28 inches. Manufactured by Raybestos-Manhattan, Inc., the belt has needed little maintenance since its installation. Du Pont "Cordura" has *extra* strength . . . permits a belt that's thinner yet stronger. And the low stretch of "Cordura" reduces expensive downtime for take-up and resplicing.

Why not consider "Cordura" before ordering your next conveyor belt? Write us for names of suppliers . . . and send for your *free* copy of the new booklet "Mine & Quarry Facts About 'Cordura'." Address: Textile Fibers Department, Room 11506R, E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Delaware.

®REG. U.S. PAT. OFF.

Du Pont "Cordura" High Tenacity Rayon

STRENGTH AT LOW COST

DU PONT

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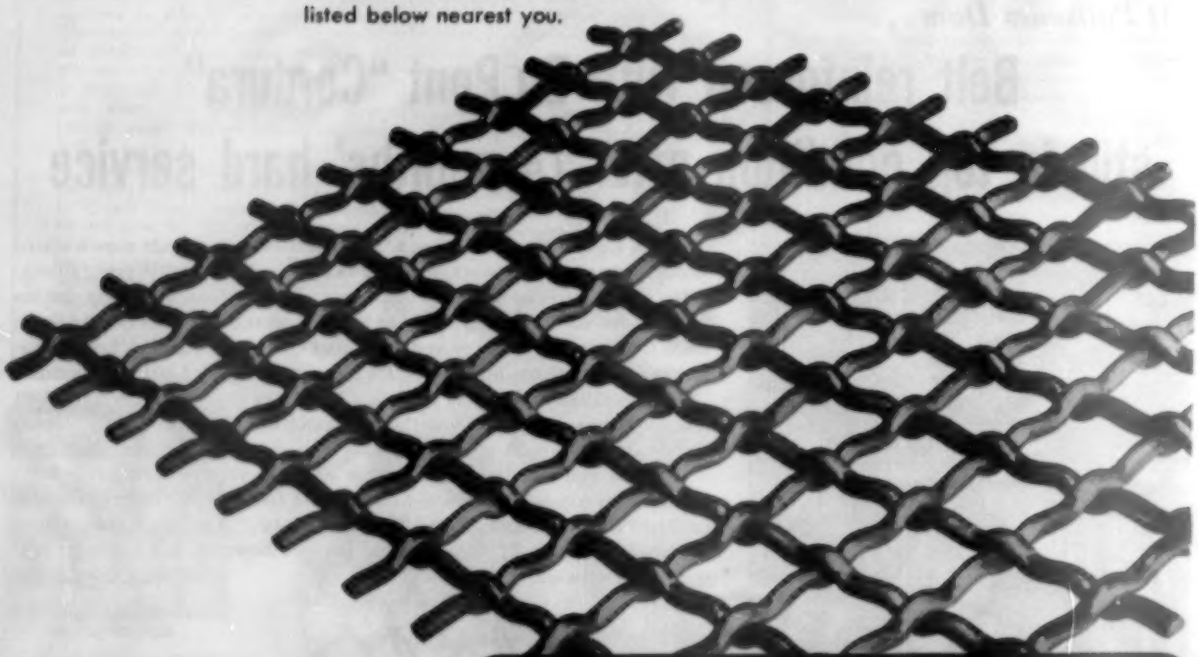
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

what does PRECISION mean to you?

To us it means space screens that are built as tools of production.

- **Made from wire that is crimped to precision standards.**
- **Then woven extra tightly to maintain accurate, uniform spacing under the severest conditions.**
- **Results in *precision* openings that will maintain their accuracy under the severest vibration.**

Let us show you how Super-Tempered Precision Space Screens mean greater tonnage output per screen dollar. For additional information write to 56 Sterling Street, Clinton, Mass. or contact the sales office listed below nearest you.

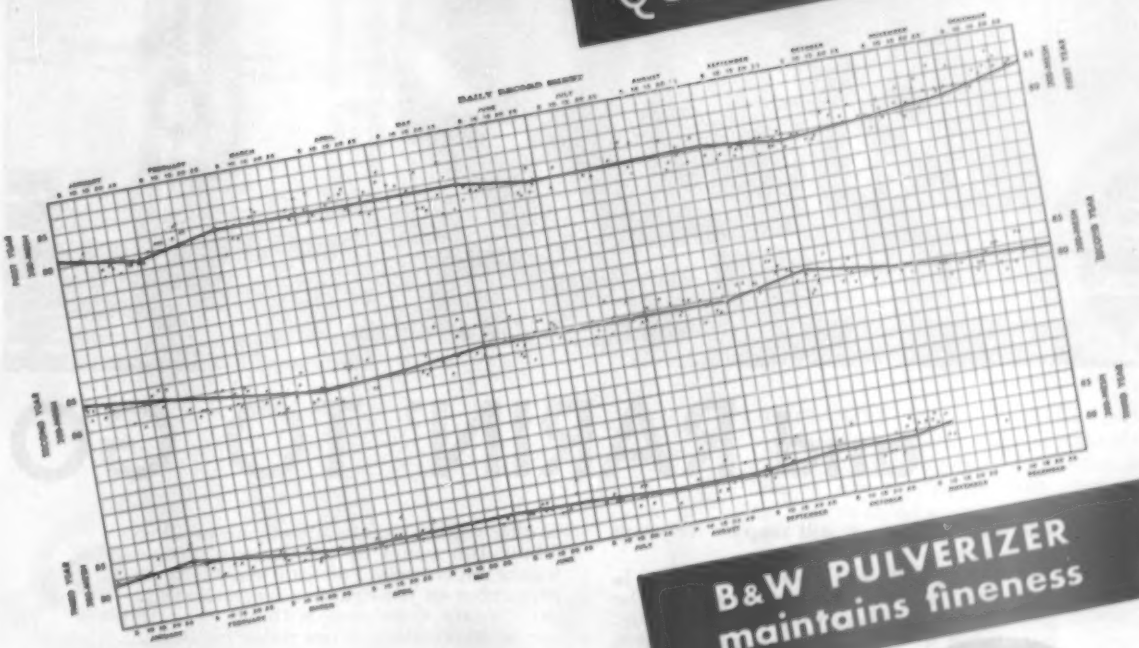


SUPER-TEMPERED
PRECISION SPACE SCREENS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CFI

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
Chicago • Detroit • New Orleans • New York • Philadelphia

2468

QUALITY CONTROL



B&W PULVERIZER maintains fineness

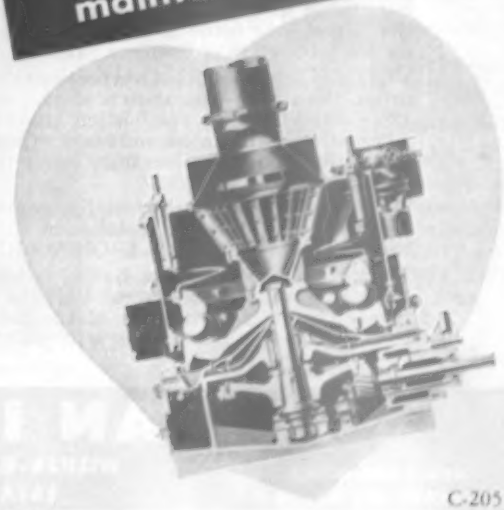
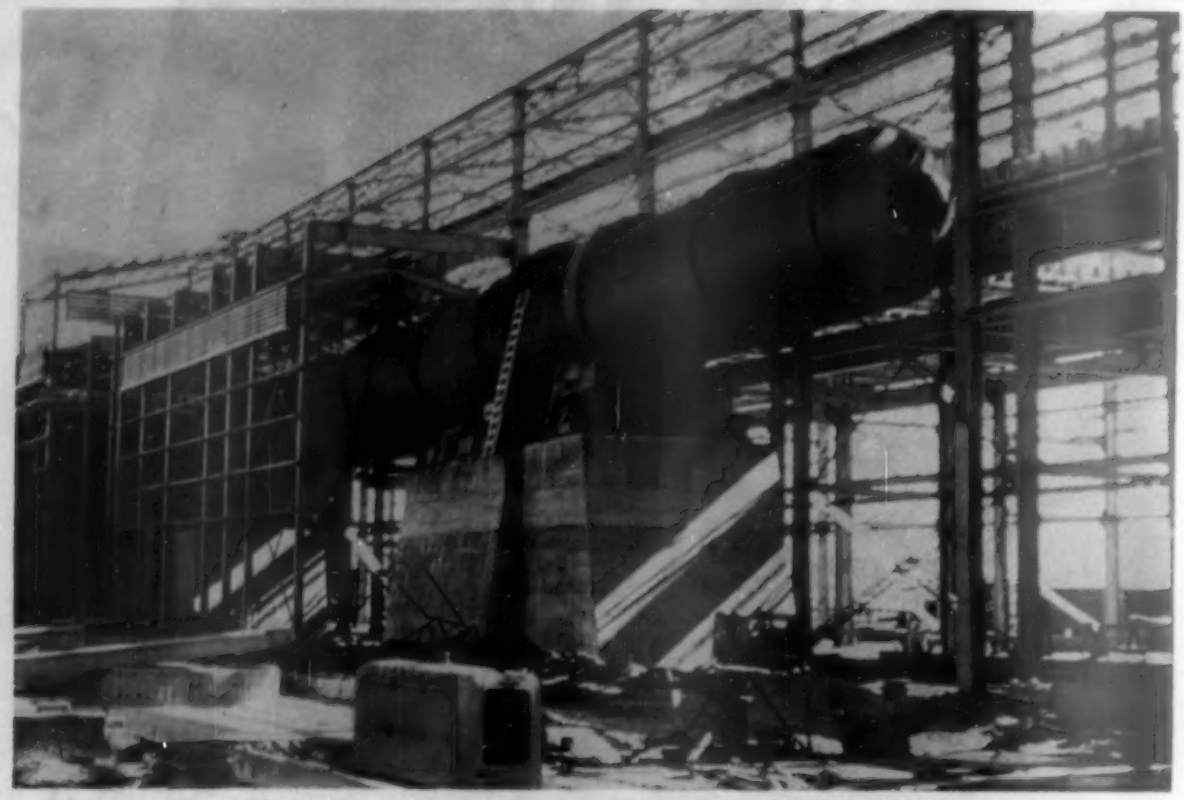


Chart shows record of a B&W Type E Pulverizer over a three-year period. The Babcock & Wilcox Company, Boiler Division, Process Equipment Department, 161 East 42nd Street, New York 17, N. Y.

BABCOCK & WILCOX

C-205

ALMOST READY



and RARIN' TO GO

And once it starts, it will keep on for years and years . . .

The VULCAN KILN shown above is mammoth, and some idea of its size can be gained by comparison with the ladder resting against it. This kiln is 12′ x 175′ and is the largest ever made in the United States for the production of titanium oxide.

VULCAN equipment that has been installed, other than the kiln shown above, is a 12′ x 22′ VULCAN combustion chamber; automatically lubricated, and easily adjusted supporting and roller bearings; latest type drive machinery.

Every bit of the pictured equipment was designed, built and the installation supervised by THE VULCAN IRON WORKS.

If you are planning to build, contact VULCAN of Wilkes-Barre. VULCAN's manufacturing facilities are of the latest, their Engineering Department is fully staffed to offer you answers to any of your problems. Their 106 years of continuous business means experience. You can benefit by this experience in constructive suggestions and preliminary drawings—without obligation (as far as possible). Write today for Bulletin A-422 on Rotary Kilns, Coolers, Dryers, Retorts, and other dependable equipment. If you have a problem, VULCAN will gladly assist you.

Any information on items listed below will be sent to you immediately:

- Rotary Kilns, Coolers and Dryers
- Rotary Retorts, Calciners, Etc.
- Improved Vertical Lime Kilns
- Automatic Quick-Lime Hydrators
- Briquetting Equipment
- Open-Hearth Steel Castings
- Heavy Duty Electric Hoists
- Self-Contained Electric Hoists
- Cast-Steel Sheaves and Gears
- Diesel Locomotives
- Electric Locomotives and Larrys
- Steel Plate Fabrications
- Hydraulic Presses

VULCAN IRON WORKS

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WILKES-BARRE, PA., U.S.A.
ESTABLISHED 1849

CABLE ADDRESS
"VULWORKS WILKESBARRE"

Only Link-Belt Speeder shovel-cranes have full power hydraulic control!

Throttling action of the variable pressure hydraulic valves permits gentle control of the load . . . accurate spotting over trucks, bins or similar targets.

--no lag, no jerk, no strain--in Speed-o-Matic

. . . on every model

EXCLUSIVE! Yes, *only* Link-Belt Speeder gives you smooth-operating, Speed-o-Matic power hydraulic control! It's another BIG reason why owners get more production . . . yards-ahead output every day. Here's the reason:

- REDUCED OPERATOR FATIGUE—fingers, not muscles, put full power to work.
- SMOOTHER CYCLES—instantaneous response, no lag or delayed action.
- MORE ACCURATE CONTROL—pinpoint spotting with complete safety.
- FEWER CLUTCH ADJUSTMENTS—clutch piston is self-compensating for normal lining wear and heat expansion.
- 150 LESS WEARING PARTS—slashes maintenance costs.

Make sure the shovel-crane you buy has money-making Speed-o-Matic control — now available in rigs from ½ to 3-yard, 6 to 60-ton sizes. Contact your Link-Belt Speeder distributor now. LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa.

Link-Belt Speeder gives you all these advantages, too!

Greatest net horsepower — with the extra "live" weight and strength to handle it.

Large, roomy cab — provides excellent visibility, greater comfort for operator.

Longer lining life — with superior friction from alloy cast-iron clutch shells.

Splined shafting and anti-friction bearings throughout upper main machinery.

LINK-BELT SPEEDER

18,734

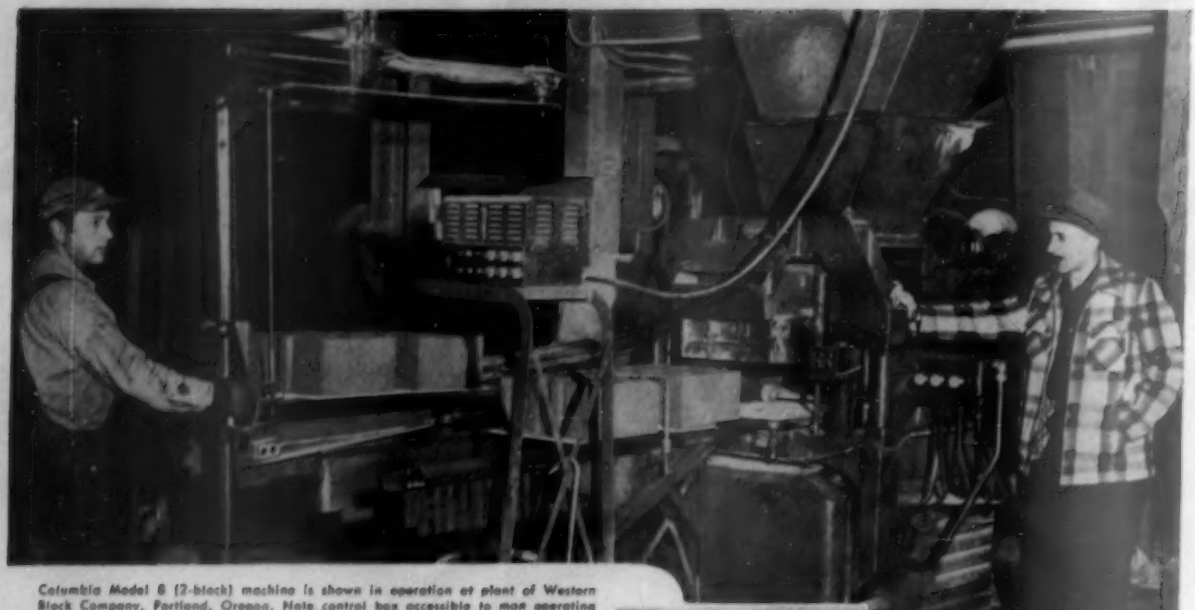
Builders of a complete line of crawler and rubber-tired shovel-cranes

CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

Fleet of 21 mixer trucks operated by Ready Mixed Concrete Co., Fort Lauderdale, Fla.



Columbia Model 8 (2-block) machine is shown in operation at plant of Western Block Company, Portland, Oregon. Note control box accessible to man operating offbearer. Inset shows Cal Felmley and his mother, Mrs. Ethel Felmley, co-owners.

CAL FELMLEY

WESTERN BLOCK CO. ☆ Pumice Blocks . .

. . STRONG LIGHT WEIGHT PRECISION MADE PUMICE BLOCK

6330 S. E. 101st at FOSTER
PORTLAND 66, OREGON

Mr. Fred Heth, President
Columbia Machine
107 S. Grand Avenue
Vancouver, Washington

Dear Mr. Heth:

We installed a new Model 8 fully automatic Columbia machine, offbearer and pallet return with cleaner and oiler in August, 1953. The increased production is very gratifying, as we are getting from 4 to 5 cycles per minute. But to us the greatest assets of the Columbia machine are:

1. Positive height control.
2. Trouble-free hydraulic operation.
3. A very simple electronic control of every stage of a cycle, including height.
4. A very easy machine to clean and oil.
5. Last but not least--a very small repair parts bill.

I can recommend this machine as the best way to High Production and Top Quality, which means profit in the block business.

Sincerely yours,

Cal Felmley

Columbia . . .

"... the best way to high production and top quality"

Says Mr. Cal Felmley of Western Block...

Talk to Mr. Felmley a few minutes, and you'll discover why he's such an enthusiastic Columbia rooter. He likes the way Columbia helps its customers set up their plants, taking full advantage of Columbia's flexible and complete line of equipment. He likes the extra-prompt service he gets whenever he has a production or operating problem.

He says the Columbia machine is everything it claims to be—fast, accurate, precision-controlled, easy to clean and maintain, quick to change from one type of production to another; rugged under continuous operation; and perhaps most important, *really automatic*.

For complete information about Columbia machines, write, wire, or phone for catalog and literature.

Columbia MACHINE

Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON

Factory Branch and Warehouse at Mukwanago, Wisconsin

District Offices in Wisconsin, Ohio, South Carolina, Mississippi, Florida, New Jersey, Virginia, California and Massachusetts.

INDUSTRY NEWS

Adds Lightweight Block Plant

BARRETT INDUSTRIES has started operations at its recently established "Barlite" concrete products plant in San Antonio, Texas, producing lightweight concrete block and pipe. The "Barlite" lightweight aggregate is produced from clay and shale deposits at the plant site. Approximately 9000 block, 2000 ft. of pipe, and 220 cu. yd. of aggregate are produced daily. The company also produces conventional concrete pipe, and colored concrete block using limestone as the aggregate. Plant equipment includes bins, elevators, cement silos, and curing rooms built of "Barlite" structural concrete. The block plant is fully automatic and electronically controlled.

Thurman Barrett, Jr., is president of the firm, whose operations and companies include: Barrett-Gragg Lumber Co.; Barrett Construction Co.; Harlandale Housing Corp.; Southwestern Acreage Co.; Suburban Water Supply Co.; a gravel washing and crushing plant on the Medina River, a ready-mixed concrete plant, and an asphalt mixing plant. Technical development, production, and quality control are under the direction of W. L. Barrett.

Buys Concrete Plant

BOSTON CONCRETE PRODUCTS Co., South Boston, Va., has been purchased by William E. Rowland of Halifax, Va. The company, formerly owned by Virginia Dunbrik Co. of Lynchburg, Va., has been producing Solite block for nine years. The firm will be incorporated, with Mr. Rowland as president.

Ready-Mix Plant

WOLF READY MIX CONCRETE is a new ready-mixed concrete company recently established at State College, Penn., by Henry L. Wolf. Plant equipment includes two G.M.C. trucks and two 3-cu. yd. Willard mixers. The company also maintains a ready-mix truck-rental service. Plant foreman is Robert Hull.

Moves Office

W. R. BENDY — Cement Engineers recently announced that it has moved to a new location at 6326 Bartmer Ave., St. Louis 14, Mo.

Large Pipe Contract

LOCK JOINT PIPE Co., East Orange, N. J., has been awarded an $837,350 contract to supply 14 miles of reinforced concrete pipe for a Kansas City, Mo., water main, to be constructed from the water plant in Kansas City, north to the Mid-Continent International Airport in Platte County. The pipe will be produced at the company's plant at Turner, Kan. The contract calls for 18,210 ft. of 36-in. pipe and 56,000 ft. of 24-in. pipe. Delivery of the pipe is to be completed in 130 days.

Cover Picture

ON THIS MONTH'S CONCRETE PRODUCTS COVER is an illustration showing the modern plant of the Ready-Mixed Concrete Co., Fort Lauderdale, Fla. Included in the fleet of 21 Ford mixer trucks are five new Marmon-Herrington, all-wheel drive units. The new six-wheel Marmon-Herrington equipped trucks are reported to average nine trips a day as compared with eight trips for the conventional trucks. These trucks do not lose time getting out of loose sand. The newest units are Concrete Transport Mixer Co. units mounted on Marmon-Herrington Ford 6 x 6's with a G.V.W. rating up to 40,000 lb.

Sawdust Block

COLUMBIA MACHINE of Vancouver, Wash., has announced a lightweight sawdust block which can be made on standard Columbia block machines without alterations or attachments. The 8- x 8- x 16-in. three-core block weighs 12 lb., and is said to have insulating and sound-proofing qualities. It is comprised of planer shavings, sawdust, cement and diatomaceous earth, and can be sawed and nailed. For interior use, the block can be used as is, or it can be polished and sprayed. For exterior use, it should be sprayed with gunite or another impervious material, due to the extreme porosity of the block.

Lightweight sawdust block may be sawed and nailed

CINDER CONCRETE PRODUCTS, INC., Kansas City, Mo., has been granted a franchise for the manufacture and sale of Marblox, by Marble Face Blocks, Inc. of Kenilworth, N. J. The Marblox concrete block has a smooth, shiny colored concrete surface, made monolithically with the block.

TRANS-MIX, a ready-mixed concrete company is building a plant at Taylor, Texas. The company also operates plants in Austin and Rockdale, Texas. Tom Waggoner is plant manager, and George Darragh is engineer.

EUREKA READY MIX CONCRETE, INC., Eureka, Calif., has purchased the Humboldt Ready Mix Co. Harold F. Nelson is president of the newly acquired company, John C. McLaughlin, is vice-president, and Frederick L. Hilger, secretary treasurer.

AL BLOMBERG of Pine City, Minn., has purchased Fowler Concrete Products plants at Pine City and Braham, Minn., from Dallas Dale Fowler, former owner and operator.

HALLETT CONSTRUCTION Co., Crosby, Minn., has purchased the Luverne Ready Mix and the Adrian Ready Mix plants from C. B. Rolph.

MAULE INDUSTRIES has begun operations at a new plant at Homestead, Fla., producing crushed stone, concrete block and ready-mixed concrete. The quarry serving the plant is expected to provide raw materials for approximately 15 to 18 years.

SPAHN & ROSE LUMBER Co. is building a ready-mixed concrete plant at La Porte City, Iowa. The plant will be operated in conjunction with the company's lumber business in La Porte City.

HENRY J. KAISER Co. has been granted a permit for the building of a $45,000 concrete batching plant at Albany, Calif. The plant will furnish concrete for improvements to the Eastshore Highway.

PRESTRESSED ENGINEERING CO., INC., has opened a prestressed concrete products plant at Wichita, Kan., reportedly the first of its kind in the area. President of the company is Henry J. Wiebe.

THE HOME CONCRETE SUPPLY Co., INC., a ready-mixed concrete firm, has been established at Ulysses, Kan., by Ralph Mendenhall, George Gindlesberger and Glen Popejoy.

JPR Co., Sheboygan, Wis., owned by John P. Reiss, is building a ready-mixed concrete plant near Plymouth, Wis.

J. N. EINUNG AND HIS SON, JOHN, have begun operations at a new ready-mixed concrete plant at Laurel, Neb.

designers —
manufacturers
of
precision
block plant
equipment

TRI-MATIC BLOCK MACHINE

FRONT PALLET FEEDER

PNEUMATIC and MAGNETIC OFF-BEARING HOISTS

ZER-O-MATIC HEIGHT and DENSITY CONTROL

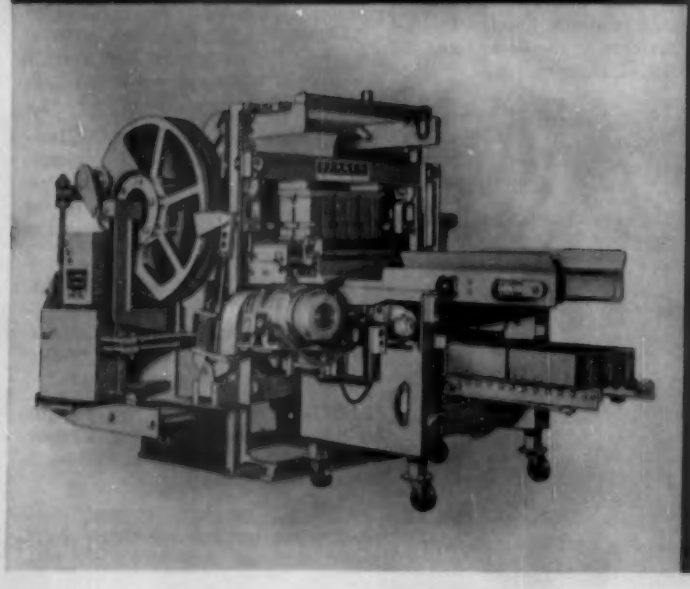
BATCH MIXER

SKIP-HOIST

PALLET CLEANER

MOLD ATTACHMENTS and PARTS

PLANT MAINTENANCE EQUIPMENT and SPECIAL TOOLS



BERGEN

MACHINE & TOOL CO., INC.

NUTLEY, N. J.

Cable address: "BERGENCO" (NUTLEY, N. J.)

ABOVE: View of girders on column tops and purlin framing in girders. Design live load, 30 lbs. per sq. ft.; column centers, 37' x 33'. Girders, purlins and columns supplied by Alatex Construction Service Inc., New Orleans. AT RIGHT: General view of completed warehouse, dimensions 185' x 266'... Consulting Engineer, Walter E. Blessey; Architect, George M. Leake; General Contractor, A and O Builders Inc., all of New Orleans.

50,000 SQ. FT. PRESTRESSED WAREHOUSE ERECTED IN 18 DAYS

THAT'S THE STORY of the new Myer Brothers Drug Company warehouse and office building in New Orleans... the entire framework including precast Perlite roof slabs erected in 18 working days. Both the 36-in. deep "I" section girders and the 22-in. deep "T" section purlins are prestressed with Roebling ⅜-in. diameter 7-wire stress-relieved strands pre-tensioned and bonded to the concrete. The prestressed members plus the precast reinforced concrete columns were purchased at an in-place cost of only 70 cents per sq. ft.

Roebling engineers, pioneers in the development of prestressing techniques and tensioning elements in America, will welcome the opportunity to cooperate with you to help assure maximum efficiency on any specific prestressed concrete application. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

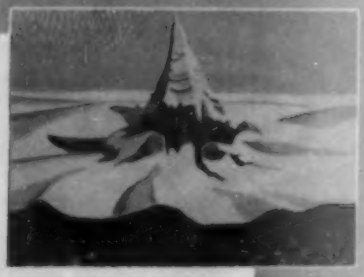
WHY MEDUSA INTEGRAL water-repellents . . . are the BEST MOISTURE BARRIER!

● Medusa Moisture Barriers made with Medusa Waterproofings are water repellent, puncture-proof, tear-proof and non-porous. You simply can't break, rip, or tear them like you can moisture barriers of plastic films, building coatings and the like.

Medusa Waterproofed Cements are integral. Unlike a coating, or a sheet, or a film, they permeate through every square inch of the concrete mass . . . every single pore, making the concrete structure an impregnable fortress against water.

When you can have integral moisture barriers at the same cost as other methods, why take chances with films and coatings. Furthermore, you know Medusa Waterproofed Cements are successful because they have a proved 48-year record of stopping moisture. They are the finest protection possible for footings, foundations, basement floors, utility room and garage floors.

You can make your integral moisture barriers by either using Medusa Waterproofed Gray Portland Cement or Medusa Waterproofed White Portland Cement, or by mixing Medusa Waterproofing Paste or Powder with any regular portland cement.



You Can't Puncture Medusa Water Repellents

You Can't Tear Medusa Water Repellents

And Medusa Water Repellents Never Become Porous!

MEDUSA Portland Cement Company

1000 Midland Building • Cleveland 15, Ohio

SALES OFFICES Cleveland, Ohio
Chicago, Illinois — Toledo, Ohio
Pittsburgh, Pa. — New York, N. Y.
Milwaukee, Wisc. — York, Pennsylvania

WHITE • WATERPROOFED WHITE • GRAY
WATERPROOFED GRAY • AIR ENTRAINING • STONESET
HIGH EARLY STRENGTH • BRIKSET
WHITE TILE GROUT CEMENT

MAKERS OF AMERICA'S FINEST PORTLAND CEMENTS FOR OVER SIXTY YEARS

NOW another Challenge 1st for positive control and efficiency

CHALLENGE *perfects the new*

MIXOMETER

. . . an exclusive standard feature of all CHALLENGE *Pacemaker** Truck Mixers

Now for the first time in the industry, ready mixed concrete producers have an accurate method of controlling the quality of the concrete . . . after it leaves the plant.

This outstanding Challenge development, the "Mixometer", tells the operator at a glance:

1. **How Fast The Drum Is Revolving Per Minute.**
2. **Proper Drum Speeds For Charging, Mixing and Agitating.**
3. **How Many Revolutions The Drum Has Turned per Trip.**
4. **Running Total of Drum Revolutions During Life of The Mixer.**

With the "Mixometer", the operator can always be sure that the drum is turning at the proper speed for producing the best concrete for the job. There's no guesswork . . . nor compromise!

Another Challenge First! The "Mixometer" is another example of Challenge leadership in truck mixer engineering, design and performance. Your nearby Challenge Dealer is ready to demonstrate the "Pacemaker's" superiority on your job.

Make arrangements for a demonstration TODAY!

COOK BROS. EQUIPMENT COMPANY
3334 San Fernando Road, Los Angeles 65
Telephone: CLeveland 6-3151

*VALUE STANDARD OF THE INDUSTRY

NEW

WeighMeister

Screw-Action Batch Lift

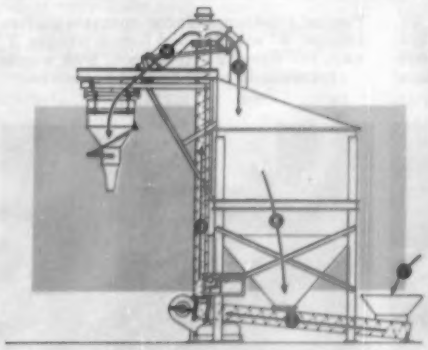
Self-Contained

Portable

Accurate

Automatic Operation

Fast!



❶ Bulk cement is delivered at track site or from truck at ground level. ❷ Feeder screw delivers to WeighMeister's vertical screw. ❸ High-capacity vertical screw lifts cement to ❹ precision batcher, which dumps either automatically or at operator's control. ❺ When pre-set weight is reached, flow automatically shifts to storage bin. ❻ Between bulk deliveries, cement flows by gravity from storage bin to feeder screw. Controls can be set to stop feeder and vertical screws automatically, if desired, when weight is reached.

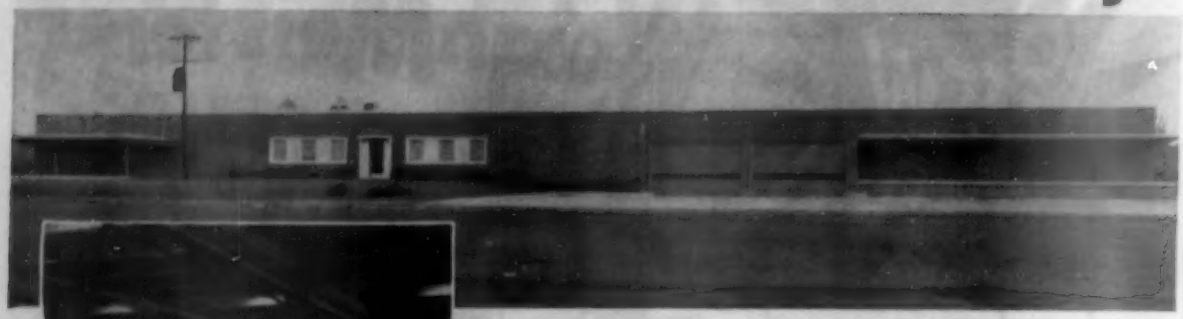
Delivery and batching are completely independent, go on simultaneously without interfering with each other. WeighMeister may be used without bin at track site for batching or transfer plant.

WeighMeister gets its capacity from the fast-working screw lift. The precision-fed batcher and automatic electro-pneumatic controls give it dependable accuracy for constantly uniform mixes. One man operates the WeighMeister by three push-buttons, with no manual levers to waste time and cause error. Low bin cuts height in half, saves on weight and initial cost. The WeighMeister is totally self-contained with its own compressor for the automatic controls and its own electric motor or gas engine. All air and electric lines are permanent; no connections to waste time in moving. Makes light, compact, integral unit easy to set on single truck. Needs no footings or ramps. Just set WeighMeister on any firm, level spot—have it running in a short time. See your distributor or write for details. L. Burmeister Co., 4529 W. Mitchell St., Milwaukee, Wis.

Burmeister

COMPLETE PLANTS FROM A SINGLE SOURCE

Concrete Prefabrication Pays



Charlotte Grocers Mutual Warehouse, 60,000 sq. ft. floor area, in "Acres for Industry" development, ten minutes from center of Charlotte, N. C.

Concrete prefabrication is growing by leaps and bounds, thanks to the economies of prestressed concrete members. This well-designed warehouse has precast girders, purlins and roof planks, all prestressed, as well as precast columns, fabricated at assembly-line speed with 'Incor'* 24-Hour Cement.

Designed for the material and method, prefabrication resulted in lowest construction cost, for a structure embodying utmost fire-safety and durability, with minimum insurance rates and lowest upkeep. Advantages well worth considering. *Reg. U. S. Pat. Off.

'Incor' concrete columns, 14" x 14", with 20" x 20" capitals, were precast at job site. Poured in morning, stripped in afternoon—48 columns produced in 12 days.

42 prestressed 'Incor' girders, each 45' long, 30" deep, top flange 12" wide, bottom flange 20" wide, web 5" thick, were cured and stripped in less than 24 hours.

Precast, prestressed 'Incor' concrete purlins, I-shape, 8" wide top and bottom flanges, 3" web, 18" deep, 24' in length, with angles for welding to girders and columns.

CHARLOTTE GROCERS MUTUAL WAREHOUSE
"Acres for Industry"
Charlotte, N. C.

General Contractor:
J. A. JONES CONSTRUCTION CO.

Architect & Engineer:
J. N. PEASE & CO.

Precast Structural Members and Roof Planks
Ready-Mix 'Incor' Concrete:
CONCRETE MATERIALS, INC.

—all of Charlotte, N. C.

Total of 60,000 sq. ft. precast roof planks, each 1¾" x 18" x 18 ft., were pretensioned at the casting plant. These planks butt together and have recesses for grouting.

At pretensioning bench, 'Incor' concrete produced stripping strengths in 18-24 hours, setting tempo of assembly-line operation as basis of substantial production economy.

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA.
BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON
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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 141,600,000 SACKS ANNUAL CAPACITY

Let Your Building SELL for You!

• Eternacrete Products, Inc., Kansas City, Kan., paints large colored sign on side of plant building

By ERNEST W. FAIR

Four-color attractive sign which draws business from those who pass on highway

SOMETHING A PERSON SEES every day of the week, which makes a definitely favorable impression, can influence future buying. This is demonstrated every day of the week by such promotional efforts as national billboard advertising and spectacular signs.

All of these cost a good deal of money and are beyond the budget of the average concrete block producer. But he has, in the vast majority of cases, an opportunity to accomplish the same effective business building and at very little cost.

It can be accomplished by letting the plant buildings sell the company's products. The majority of concrete products manufacturers are located so that one or both sides of the buildings are open and in full view of passing motorists. Most of the time this building carries a simple identification sign, and in some instances this space has been sold to a bottler or brewer for advertising purposes. If it is so profitable to the bottler or brewer, it can be equally profitable to the concrete products manufacturer.

In the accompanying illustration is shown how one midwestern firm has used the side of its building to do a selling job. It is the Eternacrete Products, Inc., in the Fairfax Industrial District of Kansas City, Kan. With an inexpensive sign, this firm has created a business promotion that is working for it every day of the year.

The sign does a complete job by not only selling the idea of the product but the products themselves. The local resident who passes by every day on his or her way to town cannot help but notice the sign and eventually absorb every word it presents. Naturally when his need for what the firm has to offer arises his sub-concious mind will very forcefully recall the sign and everything it presents.

Most firms keep the cost of such signs at a minimum by avoiding the use of "high-powered" illustrations but some have found this extra expenditure worthwhile. It is chiefly a matter of choice for the sign such as this, using words and a fairly simple illustration, has been found to be more effective from a dollar and cents standpoint than the more expensive venture. The latter is justified, however, in instances where one has a very competitive situation and something must be done to make the company's sign stand out from others.

One factor of importance in such signs is not to attempt to say too much as the passer-by generally has only a few brief seconds for even a part of the building sign to register with him. Covering the whole side of a building has generally been found to produce less results than using a small section up front or on the side, such as in the example shown herewith.

The actual ideas themselves should also be presented in the fewest possible number of words and also with the shortest words that can be used. It is also desirable to confine the thought to a single short line rather than one embracing a number of lines or using a long sentence. Again, it's a matter of the few seconds the passer-by has in which to absorb the idea.

The choice of colors used in such signs is also of importance for an effect of making the message stand out and be easy to read is also necessary. Color combinations which lend themselves to good visibility will give assurance that the sign can be read from a greater distance and thus the prospect will have more time in which to read. The particular sign herewith has a yellow, brown and green background with black letters. Black on a yellow background also has easy readability and can be seen from a distance.

In choosing color combinations for such selling signs, it is wise to select those having greatest contrast. Colors which blend into one another or which may be in attractive pastel shades are more beautiful to look at but their effect in this use is very low.

It is also of much importance to see that the company's name and telephone number stand out. This is very good procedure if it is an easy-to-remember telephone number. If it is otherwise, then concentration should be on the firm name.

The only cost after the sign is once put on is in a yearly repainting job for it is of great importance that such a sign always have a fresh and clear appearance. A shabby looking sign gives everyone the impression that it is a shabbily run business.

Concrete Masonry Promotion

THE NATIONAL CONCRETE MASONRY ASSOCIATION has issued a promotional kit, No. K-40, designed as an aid in the promotion of concrete masonry basements. It gives tips on the type of advertising and merchandising approaches, and includes newspaper advertising mats; sample sales letters; reply and follow-up cards; mimeographed one-minute and chain break radio spots; a promotional booklet; and an order form for direct mail pieces, etc. The kit is available from the association at 38 S. Dearborn St., Chicago 3, Ill.

A mechanic checking a radiator to see if any leaks have developed

• Preventive maintenance program of Ready-Mixed Concrete Co., Denver, Colo., has cut down operating costs very substantially by a continuous system of inspection, testing, repair and maintenance

By ROBT. A. LATIMER

Stopping Expensive Breakdowns

IMPRESSIVE OPERATIONAL SAVINGS of approximately 4¢ per cu. yd. of concrete delivered, plus 1¢ per mile on truck operation, are the results of an elaborate "preventive maintenance" program which has been in use at Ready-Mixed Concrete Co., Denver, Colo., for a little more than one year.

This program, along with others leading toward better personnel relations and plant efficiency, was undertaken by Frank P. Spratlen, president, after a sweeping survey of costs in mid-1952 showed a dangerously high-cost-per-cubic-yard ratio. In attempting a solution, the company looked into all possibilities, including the use of outside truck repair and maintenance organizations, revamping of the maintenance crew, etc. Eventually, after weighing all factors, it was determined to carry out this advance inspection and repair program in the yard itself during night hours, when maximum time would be available for the work.

Under the plan, Ready-Mixed Concrete Co.'s veteran maintenance foreman, an expert mechanic with more than 15 years experience with the firm, is in charge. All work is carried out during shut-down night hours, and may require only a few hours, or the entire night, depending upon the condition of the mixer truck involved. As the work is done at night, there is no necessity of tying up equipment badly needed in Denver's current "expansion boom," and repair services can be conducted with a minimum amount of interruption.

Covering 34 vehicles, the preventive maintenance program is "continuous," inasmuch as upon completing the 34th job, the cycle begins again with No. 1. Guided by carefully worked-out specification sheets, the program is designed to detect possibile mechanical troubles or breakdowns in advance, to insure adequate lubrication, good condition of controls, gear boxes, electrical equipment, safety devices, etc.

"There is nothing half-hearted about this plan," Mr. Spratlen pointed out, "such as only a cursory inspection, and the scribbling of remarks which may or may not receive later attention. Because the program is so thoroughly documented, leaving nothing to chance, the average maintenance inspection requires 12 hr. per unit, and often far exceeds that. In return, we are assured far better security against costly breakdowns, ill-will, accidents, and maximum availability of every vehicle when it is needed."

Inspections Are Thorough

The inspection program is detailed on three hectographed sheets. Each is drawn up on a monthly basis, inasmuch as experience has shown that the average unit will receive one complete servicing per month. The first "general maintenance" sheet is divided into four columns, listing inspections to be performed on the left, with separate columns for "O.K." or "not O.K." and comments. Under the truck chassis, headings are, in sequence; the cab, fenders, running board, brackets, bumpers, gas tanks, license plates and gas lines. Below these headings appear lights (head, clearance and tail), front wheel bearings, king pins and bushings, front springs, shackles, pins and bushings, brackets, clips and center bolts. Under steering are listed toe-in, tie rod, pittman arm, drag-link and steering-knuckle arms. This is followed by transmissions, propeller shafts and universal joints, brake lines and fluid, rear springs, shackles, pins, bushings, clips, spring pads, center bolts, etc. Following are radius rods, walking beams, rear wheel bearings, brakes, both service and hand, air diaphragms, actual shaft stud nuts, and torque arms.

Road Tests

At the bottom is a provision for "road test." It is nothing unusual to find a Ready Mixed Concrete Co. mixer truck undergoing severe road tests in the Brighton boulevard industrial section of Denver at 3:30 and 4:00 in the morning, as the final step in this maintenance program. The sheet closes with a space for "major repair recommendations" which the company honors without exception. If the mechanic states that new bearings, a new differential, or electrical improvements; for example, should be installed, they are automatically carried out without quibbling.

Under "panel and engine compartments," the second sheet requires inspection of operation and condition of a dozen items, with all required adjustments or repairs in accordance with the manufacturer's manual on the mixer. Again divided into four columns, this sheet covers oil pressure starter switch, choke and carburetor controls, engine belt, water pump, starter, radiator core, sparkplugs, compression (tested at each sparkplug), timing magneto, distributor rotor, dis-

tributor condenser coil, fuel pump, carburetor, air cleaner and crank-case breathers, manifold and exhaust system, cylinder head, engine oil leaks, etc. Here again, space is provided for mechanics' comments and for thorough testing.

The third sheet, which covers mixer and accessories, is heavily emphasized in the program. In the same four columns, the hectograph sheet lists for O.K. or attention, the right angle drive and clutch, transmission, mixer water pump, chain drive and sprockets, hold-down clamps, water tank glass gauges, valves, pipes, hoses, inlet covers, water inlet packing nut, the chute lifter mechanism and leakage, the feed chute, seal rings, revolving door and hopper, stationary distributing spouts, drum rollers, drum surface thickness and general condition, drum fins and general cleanliness, and condition of drum track. Thus, the final step in the inspection, calls for complete remarks by the mechanic and the signature of both mechanic and the shop foreman before the truck is put back into service. "We are actually following military aircraft inspection lines," Mr. Spratlen indicated, "with even more thoroughness, if such a thing is possible. The theory is that breakdowns are no problem until they arrive, and that the surest way to eliminate such problems is to eliminate the possibility of mechanical failure."

During the first year of the preventive maintenance program, 1953, extremely careful records were kept on operational costs, as compared to maintenance expense. Final tabulation was agreeably surprising, inasmuch as it demonstrated conclusively that during 1953 as compared to 1952, operational costs per cubic yard had been reduced by 4¢ and overall truck mileage costs by 1¢ per mile. As the company is one of the state's largest concrete producers, the savings add up substantially.

Tire Maintenance

Much of the development of this program was based on six months' previous experience which the company had with a similar program aimed at the prevention of tire troubles. Under this plan, an expert tire mechanic has been brought in each morning at 3:00 a.m. for the past 18 months. His inspection program likewise balanced to cover one vehicle after another, however, on a much more rapid-moving basis than the mechanical preventive maintenance program. A tire shop was set up by the company 20 months ago, equipped with spreader, patching equipment, vulcanizing system, high-pressure tube and tire inspection equipment, etc. While this did not represent an expensive outlay, results have been

Some of the testing equipment which is used in the program of preventive maintenance

fine, primarily in driver time saved, the elimination of costly delays and out-of-service periods traceable to tire failure, etc. While mechanical preventive maintenance naturally requires far more time and care than that devoted to tires, the end-product and the means are the same — utilization of night hours, plus the same sort of guided inspection.

Painting Schedules

Ready Mixed Concrete Co. also shuffled schedules to permit application of a new paint job on all of its vehicles, and since that time, it has been the responsibility of the night crew to touch up paint jobs, straighten out minor dents, etc., which occur in daily operation. This has not proved entirely satisfactory, according to Mr. Spratlen, inasmuch as it has been difficult to match paint precisely. A practical solution to the paint job problem has been found in the form of a bi-monthly competition between teams of drivers, 17 men on each "side" who vie for merchandise prizes awarded for best truck maintenance, most impressive truck cleanliness, closest attention to safety, economy and other details.

Concrete Program

THE MID-WEST CONCRETE EXPOSITION will be held February 24-26, at Navy Pier, Chicago, Ill. The exposition, sponsored by the Concrete Contractors Association of Greater Chicago, will highlight new developments in the field of equipment, tools and materials. A program of panel discussions and papers covering some of the latest developments in the use of concrete will be included. The program includes a panel discussion entitled, "The Architect Looks at Tilt-Up Construction;" two forums on residential concrete, conducted by James T. Lendrum, Director of The University of Illinois Small Homes Council; and a panel discussion on mutual problems of producers and users of ready-mixed concrete. The design and construction of thin shell concrete roofs will also be reviewed. Two four-session courses will be presented: "An Introduction to Prestressed Concrete," by T. Y. Lin, professor of Civil Engineering, University of California; and "The Design and Construction of Precast Tilt-Up," by F. Thomas Collins, engineer and builder of southern California.

Concrete Products Meeting

THE CONCRETE PRODUCTS ASSOCIATION of Michigan recently held a 2-day meeting in Muskegon, Mich., with approximately 40 officials of concrete and masonry production firms from throughout the state in attendance. Officials of Wisconsin concrete products firms were honored as special guests. The meeting was opened with a banquet, followed by the business sessions. Among those present at the meeting were: C. A. Sirrine, executive secretary of the Michigan association; Roy S. Winters, Muskegon, Mich., state board member; David Warsaw, Detroit, Mich., also a board member; Ray Minette, president of the Milwaukee, Wis., group; Benjamin Wilk, Detroit, president of the Michigan group; Frederick Yahr, West Bend, Wis., president of the Wisconsin association; S. H. Markle, Muskegon, a Michigan board member; and Cloyd Fellabaum, an official of National Cement Products of Toledo, Ohio, guest speaker.

CONCRETE

In Church - Home - Garden

By Louise Price Bell

• Attractive examples of ways in which concrete can be used are found in the accompanying page of illustrations. Although all the illustrations are from Tucson, Ariz., they represent ideas in architecture and garden treatment which are applicable to other sections of the United States. Concrete products manufacturers might profitably accumulate ideas of this kind to promote additional business.

Illustration No. 1 shows the effect of combing concrete with a special rake which can be obtained in many hardware stores. The rake is drawn over "green" concrete. When small areas of a home are given this treatment, it gives an unusual and different effect.

No. 2 shows a barbecue which is made of ordinary concrete stepping stones which have been split to reveal the rough texture. The working surface of the barbecue is capped with smooth concrete tile block. The floor is of plain green colored concrete.

No. 3 shows how chimney block provide a screen for a house entrance. The pattern is interesting and air passes through the openings.

Nos. 4 and 5 are illustrations of a church under construction and after completion. The roof is constructed with Flexicore slabs, 22 ft. long, laid so that there is a 4-in. overlap to give a step effect.

No. 6 shows how a concrete terrace surface is broken up with wooden strips arranged as converging angles.

(Continued on page 200)

(1) **Combing concrete** while "green" gives the unusual effect, above

(2) **Barbecue in patio** made of stepping stones which have been split to present a rough texture, above

(3) **Chimney block** form a buffer between street and building, above

(4) **Roof of Faith Lutheran Church** in Tucson, Ariz., made with Flexicore slabs which overlap 4 in., left

(5) **Showing attractive appearance** of complete church, right

(6) **Surface of concrete terrace** is broken up with wooden strips, below

(7) **Concrete seat** around tree, below

(8) **Narrow strips of wood** laid "hit and miss" in the concrete, below

NEW MACHINERY

Concrete Discharge Chute

MONARCH ROAD MACHINERY CO., 1331 Michigan St., N. E., Grand Rapids 6, Mich., has brought out the "Dyna-Chute" electric hydraulic power control for automatic adjustment of the discharge chute of mobile truck transit-mixers. Its one-man, one-lever operation raises, lowers, or holds the chute, and is said to have a capacity of over 2000 lb., and 1 g.p.m. It is available for 6- or 12-volt systems, and combines the pump, motor, valve, oil reservoir, and solenoid in one unit. Also included in the kit is a 15-ft. insulated battery cable, hydraulic ram, flexible hose, and fittings for all average installations. The control has a steel hood for protection against the weather.

Electronic Batching System

THURMAN MACHINE CO., Scale Div., 156 N. Fifth St., Columbus, Ohio, has introduced the Thurma-tronic electronic batching system, which may be set to weigh one batch or for completely automatic continuous batching. The controls may also be set to weigh a specific number of batches. The electronic design is said to be unlimited in the number of materials that may be batched in one formula, and a formula requiring change by the batching operation can be reset to meet production requirements. New or existing plants can be equipped with the system, which is said to permit a batching cycle to be completed in a matter of seconds.

Batch Water Control

NEPTUNE METER CO., 50 W. 50th St., New York 20, N. Y., has announced the Auto-Stop meter for automatic water control in ready-mixed concrete and concrete block batches. A "Double-trip" register and valve slows down the flow of water an instant before it trips shut, thereby permitting accurate cut-off with no water-hammer. Large numerals on the meter face provide a visual check on the flow. The flow can be stopped instantly at any time by pressing the emergency stop button on the register, without affecting the meter reading or Auto-Stop setting. The delivery can be continued to its conclusion by reopening the valve, or the register can be reset for a new quantity before continuing. The meter, register and valve are of rugged construction, and weatherproof, corrosion-resistant design. Meters are available for handling cold, warm or hot water, in sizes of 1-, 1½-, 2-, and 3-in. for handling rates of flow from 5 to 300 g.p.m. Round-dial, manual control water meters are also available.

Vibrating Table

CONCRETE MOLD & ENGINEERING CO., P. O. Box 183, Battle Creek, Mich., has brought out a heavy-duty vibrating table which handles molds weighing up to 750 lb. The unit incorporates many of the features of the standard "Conveyor Type" vibrating table, and may be adjusted to provide mild to intense vibration. Table top dimensions on the model are 36 x 18 in., and standard heights from the floor to table top are 16 in. and 26 in. However, these dimensions can be varied for different applications.

Truck Mixer

BLAW-KNOX CO., Pittsburgh 38, Penn., has added a 4½-cu. yd. capacity Hi-Boy truck mixer to the Model M series, which also includes 5½- and 6½-cu. yd. sizes. The mixers are available with either an open or closed-end drum, and a stationary charging hopper fits into a large diameter charging cone in the drum opening which rotates with the drum. This is said to eliminate spilling during the charging operation, and permit fast loading. It is also designed to increase the water level capacity of the truck mixer drum in the new model.

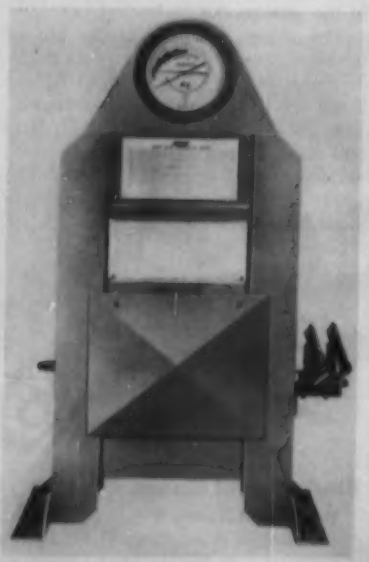
The mixer shell and blades are of wear-resistant Manten steel, with thicker plates in the front sections of the drum where the greatest wear occurs. The distributing chute is 10 ft. long and bowl shaped at the upper end to eliminate hard-to-clean corners. The upper end is pivot mounted and supported by an adjustable strut.

Block Height Gauge

BERGEN MACHINE & TOOL CO., INC., 189 Franklin Ave., Nutley, N. J., has developed a cadmium plated concrete block gauge which can be used for either 7⅝- or 7¾-in. high block. The gauge has two small "legs," making contact at only two places on the pallet, thus facilitating use on encrusted pallets. The gauge provides ready detection of height, by looking at the top edge of the gauge.

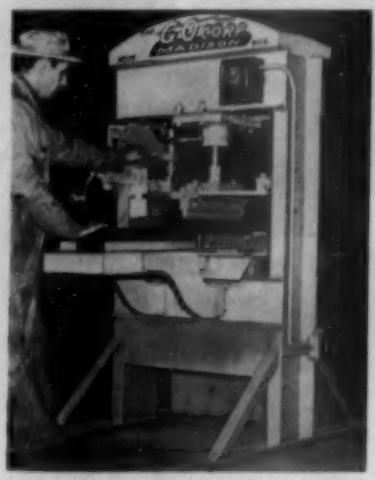
Portable Batching Plant

NOBLE CO., 1860 Seventh St., Oakland 20, Calif., has brought out the "Noble-Mobile" portable batching plant, featuring a 28-ton, three-compartment aggregate bin. The plant includes an air compressor, water meter and panel board with switches for all motors. Its advantages include: 1000 cu. ft. of bulk cement storage, with handling facilities from bulk truck to batcher; stationary 2- cu. yd. batcher, with a separate cement compartment having an air-ram-operated dump gate; manual or automatic aggregate weighing; and fully automatic control of cement weighing. The plant has an output capacity of 60 cu. yd. per hr.



Compression Tester

FORNEY'S INC., 209 Elm St., New Castle, Penn., has announced the Model QC-200 concrete compression tester, capable of handling cylindrical specimens, and building units up to and including 12- x 12- x 18-in. in size, with a capacity of 400,000 lb. platen pressure. It is equipped with a direct reading gauge with a 12-in. dial and traveller hand, and a conversion chart, mounted directly below the gauge, gives conversion from platen pressure to p.s.i. for standard sizes not shown on the dial. The lower platen is mounted on a spherical seat so that specimens can be aligned top and bottom, and an 8-in. diameter piston is raised by means of dual high and low pressure pumps. The unit is equipped with a surface ground, 18- x 22-in. steel plate, which fastens directly to the frame and provides a work table for levelling and capping. Riser blocks, which fit between the lower platen and the piston, adjust the platen height to suit the specimens being tested.



Concrete Block Splitter

THE GENE OLSEN CORP., 401 Grace St., Adrian, Mich., has introduced the Go-Corp-Madison block splitter for straight or angle splitting of concrete block 1 to 8 in. high, and widths and lengths up to 18 in. It features hydraulic operation; semi-automatic cycle with a capacity of 20 cycles per min.; and hardened steel blades. It can be made fully automatic with a return conveyor for one-man operation.

Rubber-Based Coating

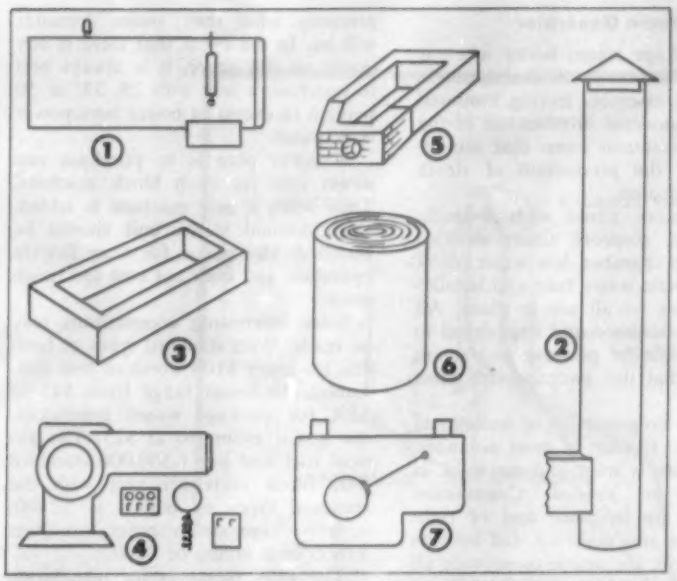
PRECO CHEMICAL CORP., 84 County Court House Rd., New Hyde Park, N. Y., has brought out a masonry coating, known as "Pliotone," which incorporates the properties of a synthetic rubber based resin, Goodyear Tire and Rubber Co.'s Pliolite S-5. It is said to be durable, water and chemical resistant, non-oxidized, mildew resistant, and have a long-lasting finish that does not yellow with age. Although it is water-resistant, it is said to permit breathing of masonry surfaces, thus allowing trapped moisture to escape. The coating is available in nine, non-fading colors, and may be applied by brush or spray.

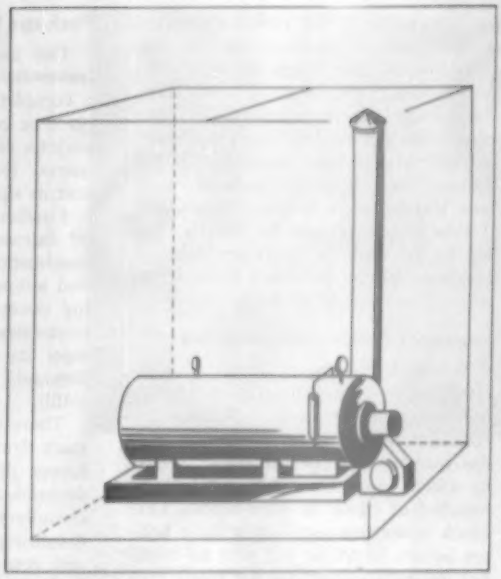
Concrete Batch Mixer

COLUMBIA MACHINE of Vancouver, Wash., has introduced a 3-cu. yd. concrete batch mixer, designed for use in concrete block plants. The mixer handles 10,000 lb. of semi-dry mix at one time. It is powered by a 75-hp. electric motor and is equipped with Ni-Hard liners and blades. The billet steel shaft is 7 in. in diameter. The mixer has a capacity of 81 cu. ft.; other Columbia batch mixers are available in 12, 25, 42, and 50 cu. ft. capacities.

Fork Lift Attachment

SHERMAN PRODUCTS, INC., Royal Oak, Mich., has announced the Sherman Fork Lift, a fork lift attachment, originated by K-D Manufacturing Co., Cleburne, Texas, and further developed by the Sherman company, for mechanized material handling on off-pavement surfaces. It is designed for use on Ford tractors, and operates hydraulically, lifting a load up to 4000 lb., 10 ft. into the air. By means of reversed steering and driver's seat, the unit moves in the opposite direction from a tractor, the conventional rear wheels becoming the forward wheels. Power steering is provided as a standard feature. In addition to 27-, 33- and 48-in. lift forks, other attachments include a crane, angle dozer, scoop bucket, concrete bucket and concrete block forks.





To the left: Standard boiler arrangement, requiring: (1) boiler shell, tubes, safety valve, gauge glass and water column; (2) brick or steel stack; (3) concrete foundation; (4) oil burner and controls; (5) combustion chamber of firebrick; (6) blanket insulation; and (7) automatic low water cutoff and water feed. **To the right: Package steam generator,** including all the seven items in one unit

PACKAGE Steam Generators

Their Place in the Concrete Block Industry

By WILLIAM J. SHORE*

A NEW PRODUCT in the field of steam generation is known as "the package steam generator." Many concrete block plants have installed them, and the opinions generally expressed of this type of boiler are decidedly fifty-fifty. Many block makers look upon them with favor, and an approximately equal number consider them unsatisfactory.

Because of this, this article has been prepared to present the varied and unusual aspects of package steam generators and to point out their relative advantages and disadvantages, particularly in the field of providing steam for curing concrete block. No matter what field we consider, all new developments and new equipment demand time to permit them to become standardized.

In due time, design becomes more or less standard, the users know what to do to obtain best operation, they know what they can expect and in consequence they give them proper care and attention and ultimately obtain highly satisfactory service from such new equipment.

*Shore Engineering, New York, N. Y.

The reasons why package type units are smaller than ordinary types of boilers are basically two in number.

Principles of General Design

(1) Through the promotion of a rapid and violent flow of boiler water through the tubes and drum surfaces (forcing away the hottest water and replacing it violently with cooler water), it becomes possible to achieve a more rapid transfer of heat from the incandescent burning fuel, through shell or tubes and into water to be converted to steam.

(2) Through use of forced draft in the combustior of fuel, eliminating the smoke stack, and permitting a far more rapid and concentrated heat release in a smaller combustion chamber.

While neither of the above principles are new or novel, it is only in the package type units that they are universally applied, and in addition to many advantages, the practical aspect is far greater steam production in smaller equipment.

An apt comparison would be the modern new high speed automobile engine which has replaced original engines of low speed. Weight for weight, the modern engine delivers twice the horsepower achieved in the old automobile engines.

Standard Boilers vs. Package Units

For simplicity and greater effectiveness the sketches shown, while perhaps rough and crude, are, nevertheless graphic and decidedly to the point.

STANDARD TYPE BOILERS

These require the assembly of many separate packages before they may be put to use.

Items

1. Boiler shell, tubes, water column, gauge glass and safety valve
2. Chimney, steel or brick
3. Concrete foundation
4. Oil burning equipment, all controls and regulators safety limits
5. Combustion chamber or refractory or fire brick
6. Insulation blanket to cover boiler surface
7. Low water cutoff and automatic water feed

PACKAGE TYPE BOILERS

These come in one complete package and require no outside assistance to assemble them.

Come complete with Items

No. 1
2
3
4
5
6
7

When the ordinary type boiler is bought, the boiler manufacturer supplies only Item No. 1, the boiler itself.

It then becomes necessary to purchase in addition all items from No. 2 to No. 7 inclusive.

The boiler manufacturer's responsibility is limited only to the boiler itself, and nothing else. But, the block manufacturer is more concerned in

the operation of the entire steam assembly, and if anything goes wrong, there is divided responsibility. The boiler maker blames the contractor that made the installation, and the contractor has no hesitation in throwing the blame back upon the boiler maker. The following comments show how this happens in many instances.

Where boilers give trouble, it may not be the fault of the boiler, and the incidents quoted are based upon actual cases, encountered in block plants.

Improper Chimney Dimensions

Where the chimney is not of sufficient height or in diameter or interior cross section, the draft is inadequate, consequently there is a shortage and the burner will operate only at half its rated capacity and there will be insufficient steam to cure blocks. One block manufacturer bought three boilers before he found out why he could not get sufficient steam for block curing.

To cut costs, a contractor installs oil burning equipment of wrong size, one that cannot burn sufficient oil to generate full horsepower, and the boiler will not develop sufficient steam, regardless of its size.

Inadequate Combustion Chamber

This is made of a refractory unit and through its incandescence maintains ignition. If it is not deep enough, nor wide enough, nor long enough it gives much trouble. If too small, it becomes impossible to burn sufficient oil to produce necessary steam. If too small, there is a tendency to create smoke and to pulsate. If too small, the burning oil flame impinges on furnace of boiler and causes rapid deterioration and makes it necessary to replace tubes that burn out. Small chambers require frequent replacement because of brick failure.

Failure to Replenish Water Supply

Boiler usage in block plants is entirely different from ordinary practice. In block plants, all water converted to steam leaves the boiler and does not return. Therefore the means to be applied to insure disconnection of fuel in case of low water, and the type of safety device to insure a constant feeding of water to the boiler must be of unusual design and with a high degree of performance reliability.

Ordinary types of low water cutoffs frequently fail, and where thorough maintenance of water level is apt to fail, serious loss, even complete destruction of boiler follows.

It is therefore plain to see, that for the ordinary type of boiler there are many potential sources of troubles, such as insufficient steam and reliability of performance.

Package Steam Generator

The package steam boiler when it leaves the factory for its destination is a complete assembly having mounted on it or connected in place, all of the various constituent items that are required for the production of steam and its operation.

Furthermore, items, such as stack, oil burners, controls, safety devices, combustion chamber, low water cutoff and automatic water feed and insulating covering — all are in place. All have been designed and engineered to meet the specific purpose and steam demands that this package unit must fulfill.

There is no possibility of inadequate stack draft. In fact, in most instances, forced draft is used and no stack is demanded or needed. Combustion chambers are in place and of right dimensions and make-up. Oil burners and controls are ample to provide all fuel required, and in cases where heavy fuel oil is burned, there are provided ample heating devices to heat this oil to proper temperature and free flowing constituency so that it will burn easily and freely and without smoke or smudge.

Low water cutoffs and automatic water feeders are generally of special types and design to prevent failure in this regard. Most of them are designed to operate on metal expansion due to overheating, or else through failure to complete electric circuits through failure of water to reach its proper level.

Insulation applied to the boiler shell is generally of ample thickness and of high insulating value and protected against mechanical damage. To sum up briefly, and concisely, these features are advantageous:

Boiler manufacturer accepts complete responsibility for

1. Smooth trouble free operation,
2. Complete co-ordination between all elements comprising the assembly,
3. Delivery of rated quantity of steam continuously.

Boiler Horsepower Deliveries and Overload Characteristics

A package steam generator unit delivers its full rated boiler horsepower. A fire tube boiler can deliver 150 percent of its rated horsepower (compared with hand firing). A water tube boiler can deliver 250 percent of its rated horsepower. This phase of the problem is mentioned because very frequently, block manufacturers feel aggrieved if they cannot get more than the rated capacity of their steam units.

Package units are not designed for overload. It is therefore essential that block manufacturers make sure when they install such units that they know precisely what their steam demands will be. In the event that there is any doubt on this score, it is always best to purchase a unit with 25, 33, or 50 percent in excess of boiler horsepower anticipated.

A better plan is to purchase one steam unit for each block machine. Thus when a new machine is added, an additional steam unit should be installed. This makes for more flexible operation and does not cost too much more.

Some interesting comparisons may be made. With standard types of boilers, for every $100 worth of fuel consumed, the losses range from $35 to $50; for package steam generators, the loss is estimated at $25. The annual fuel cost per 1,500,000 standard 8-in. block units per year with the standard types of boilers is $2400; with package steam generators it is $1600 or a saving of $800.

The total steam boiler installation cost, excluding oil tank (correct plus or minus 6 percent) for a 50 b.hp. unit, using light fuel oil, is $5000 for standard boilers and $5000 for the package units, but for a 100 b.hp. unit, using heavy fuel oil, it is $9000 for standard boilers as compared with $8500 for package units.

Space requirements for a 100 hp. standard steam boiler installation call for a length of 20 ft., width of 15 ft., and height of 13 ft.; for the package generators the dimensions are 20 ft. length, 10 ft., width, and 9 ft. height. For the standard boiler, the floor area is 300 sq. ft., and a cubic content of 3900 cu. ft.; for the package generator, it is 200 sq. ft. floor area and 1800 cu. ft. cubic content. The cost of boiler room enclosure is $3500 for the standard boiler as compared with $2000 for the package generator.

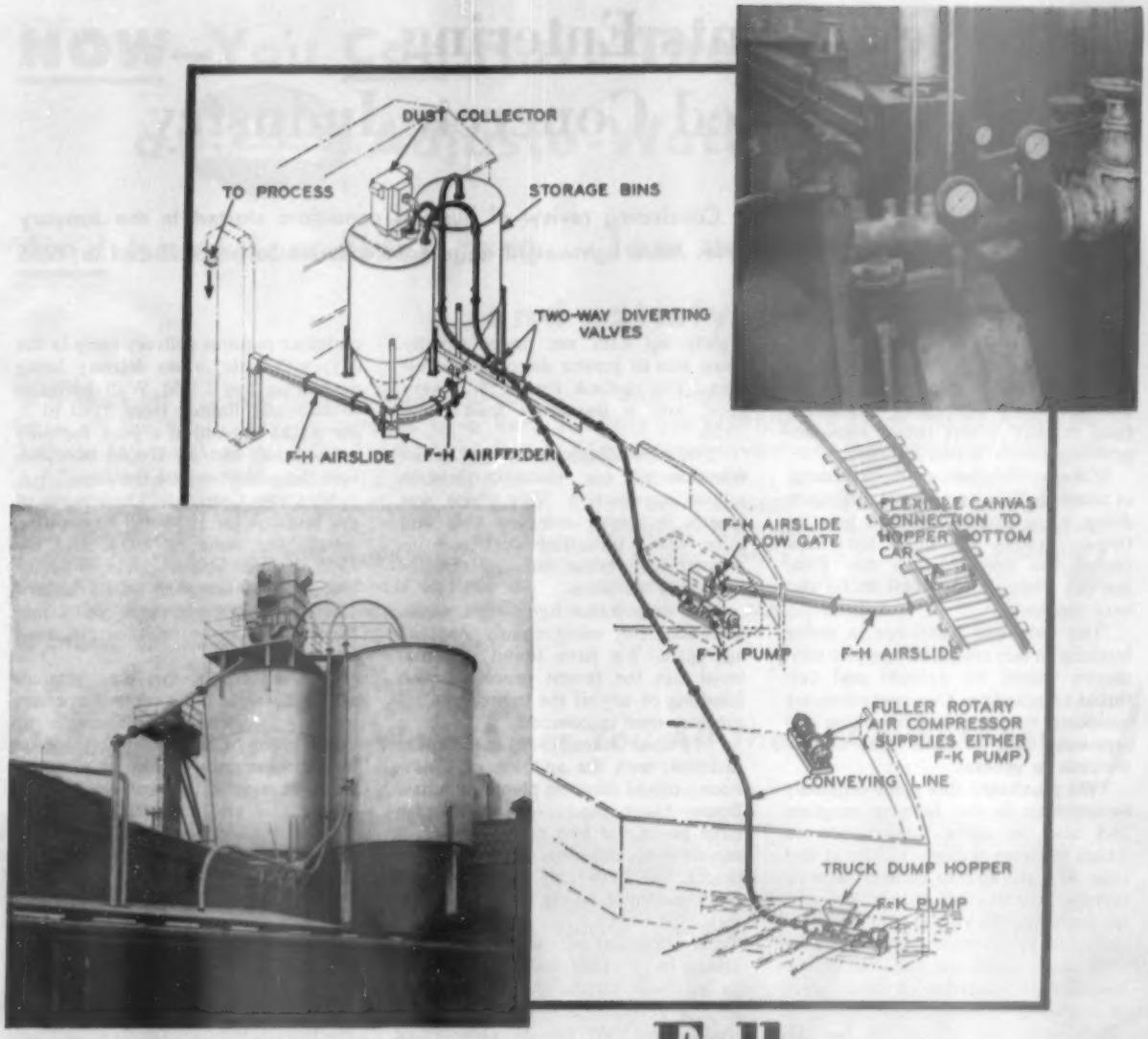
The cost of maintenance and repairs per annum ranges from approximately 4 to 8 percent for both, depending upon care.

Advantages and Disadvantages of Package Steam Generator Units

DISADVANTAGES: The outstanding disadvantage of package steam generator units is that they are completely unable to develop overload capacity. Where a unit carries a rating of 100 b.hp., nothing can be done to extract 110 b.hp. out of this unit.

ADVANTAGES: All units develop their full rated boiler horsepower. This is unconditionally guaranteed by the manufacturers who assume complete responsibility for all around boiler performance. Because in all these units are incorporated latest scientific developments in the field of heat production and heat transfer, it is possible to guarantee consistent efficiency

(Continued on page 200)



Certain-teed makes certain with Fuller

... Unloading and conveying system pays off

A few years ago, Certain-teed Products Corporation decided to find, if possible, more economical methods of operation in its York, Pa. plant. One problem given serious consideration was the handling of incoming limestone and slate filler dust received in bags, requiring costly, manual labor, resulting in breakage of bags with consequent loss of material and a dusty condition in the plant.

Together, Certain-teed and Fuller engineers made studies of their layout and came up with a solution—a combination of the Fuller-Kinyon Conveying System and F-H Airslides.

Two Fuller-Kinyon Pumps are used. One conveys limestone dust from hopper-bottom cars, utilizing the Airslide to convey from cars to the pump located in a pit in the plant. This pump conveys to either one of the two storage bins . . . efficient, clean, rapid transfer from cars to storage. The other pump handles the slate dust, delivered in trucks, also conveying to storage. Withdrawal of either material from storage bins is accomplished with Airslides, which discharge to an elevator delivering to process.

Air for the pumps is supplied by a Fuller Rotary Single-stage Compressor, having a capacity of 482 c.f.m. at 20-lb. pressure. Low-pressure air, for the Airslides, is supplied by a small blower.

It is reported that the savings realized by the use of this Fuller system has paid for the installation in less than two years of operation.

Possibly your materials handling is antiquated and costly, which could be remedied by a comparatively small investment. Why not find out . . . have a Fuller engineer study your operation and submit a report . . . it will cost you nothing, nor obligate you in any way.

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DRY MATERIAL CONVEYING SYSTEMS AND COOLERS . . . . PREHEATERS . . . . COMPRESSORS AND VACUUM PUMPS . . . . FEEDERS

Many New Plants Entering the Ready-Mixed Concrete Industry

• Concluding review of business conditions started in the January issue. More lightweight aggregate concrete to be produced in 1955

SPACE LIMITATIONS prevented the publication of all reports of business conditions in the January issue. The following interesting comments from readers' letters reveal some interesting trends in the industry.

KANSAS: "We have made no change in plant facilities and do not anticipate doing so at present. We do not use two-way radio. We don't have new competitive operations in our area, but our competition is not stable and very unethical.

"Our principal handicaps in doing business in this area are economic conditions caused by drought and cutthroat competition. Our operations are incidental to our quarry operation and represent only a small part of our business in general.

"We purchased this plant originally to assist us in our housing program and also in street construction in which we were engaged locally at that time. We are able to conduct a satisfactory operation in connection with the plant for the reason that the same personnel can conduct both operations with small additional aid. We do accomplish the purpose of using some of our own crushed stone aggregate which otherwise would not be utilized."

CALIFORNIA: "Business volume in our area for 1954 was almost identical with that of 1953, which incidentally was at an all time high. The outlook for 1955 is very favorable with perhaps a slight decrease in volume.

"Several new competitive concrete operations started in our area during 1954. Competition seems to be getting keener every day and it is my prediction that should business decline to any appreciable extent, competition will increase accordingly.

"The principal handicap in our area appears to be the traffic situation. This is caused primarily by the influx of new people in the area which has made our streets and highways inadequate to carry the heavy traffic loads. Zoning restrictions also are a constant problem to our operations."

PENNSYLVANIA: "The volume of our business in 1954 was about 15 percent greater than 1953. Gross prices were slightly up with net prices slightly down due to greater discount concessions. The outlook for 1955 is very good, and it should at least equal 1954.

"The most significant change in distribution of our materials was in school construction. This phase was greatly increased over last year and prior years. Industrial work was increased with home building remaining about the same.

"We do produce lightweight aggregate concrete, using mainly Zonolite aggregate. We have found this material has the fewest problems with handling of any of the lightweight aggregates used in concrete.

"We have recently expanded plant facilities, with the addition of a new transit-mixed concrete plant and a new Besser block machine. Likewise we have purchased two new 5½-cu. yd. mixers and mounted them on new trucks. We have also begun using a block unloader which is very satisfactory.

"We installed two-way radio in the Spring of this year, and have found it to be most satisfactory. We started with it in two transit-mixed concrete trucks and two official cars, along with a base station at two of our plants.

"Today, the handicaps in business seem to be the fact that the market is in favor of the buyer, with competition granting greater price concessions and thereby making it necessary to do more business to obtain a profit equal to previous years."

OHIO: "Business volume in 1954 was about 4 percent higher than 1953 and the outlook for 1955 is excellent.

"We purchase small quantities of lightweight aggregates for production of ready mixed concrete in such instances as lightweight aggregates are specified. We use two-way radios in the cars of our sales and service men. Our trucks are not so equipped.

"Principal difficulty in the ready-mixed concrete business arises from the fact that the concrete, after delivery must be processed for a considerable period by the contractor before his workday ends. Almost every customer requires delivery early in the day, with little or no delivery being made after 2 or 3 P.M. With deliveries substantially limited from 7:30 to 2, the trucks operate at a peak for only a few hours and are forced into idleness the remainder of the time."

WESTERN CANADA: "The volume of our business for 1954 will be approximately the same as 1953, and the 1955 outlook would appear to be the best for our company in its history. There is a price increase going into effect at this time on concrete, sand and gravel.

"We do not at this time produce any lightweight concrete, but are very much interested in it. There is no general use of lightweight aggregates in this community at present, although we believe it is the material for the future, and are interested in developing this product.

"At the beginning of this year, we expanded our plant facilities from a 2-cu. yd. batcher and 2-cu. yd. mixer to a fully-automatic 6-cu. yd. batcher with a 6-cu. yd. tilting mixer. The overhead storage of 600 cu. yd. and 650 bbl. of cement gives us one of the most modern plants in the Pacific Northwest. We took the existing batch plant and moved it, giving us a third ready-mixed concrete location in the Lower Mainland area. We have increased our mixer fleet in the past twelve months by 33⅓ percent.

"We do not use two-way radios in our delivery trucks, but we do use car radio-phones for all servicemen and salesmen."

TEXAS: "Our prices were slightly lower, and our volume in 1954 was about 65 percent above 1953. We are looking for an increase in volume in the neighborhood of 30 to 50 percent in 1955.

"Our home building volume was much greater in 1954 chiefly due to the fact that, previously, most of the concrete going into homes was mixed on the job using pit-run gravel, which was allowed by the FHA and VA. This was changed to allow "remix" or better, which made us more competitive in price.

(Continued on page 201)

NOW—You Can Have The Best . . .

a REX® Adjusta-Wate Moto-Mixer

And have low first cost . . . low weight . . . and satisfy your customers!

Why settle for less than the best, when you can have all the top-quality advantages of a Rex Adjusta-Wate Moto-Mixer? There *is* a Rex Adjusta-Wate that will exactly fit your operating needs — your weight limitations . . . and your pocketbook!

Want *lowest first cost* . . . want a truck mixer that will stand up under the *toughest* continuous heavy-duty service? There *is* a Rex Adjusta-Wate to answer any requirement!

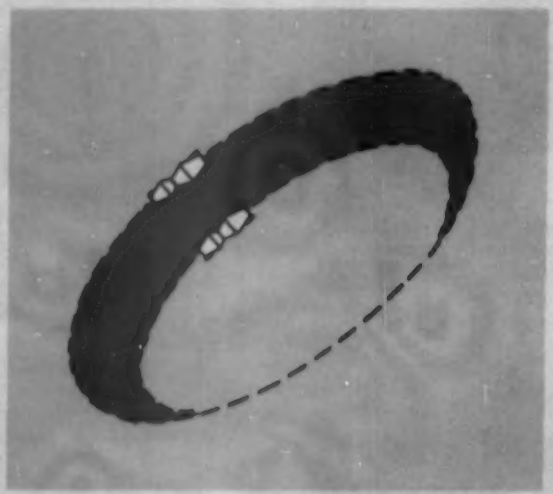
And, regardless of the size and type Adjusta-Wate you select, you'll get all the exclusive Adjusta-Wate advantages that mean you haul more . . . save more . . . make more every trip, every day, every season. You'll mix, haul and deliver the top-quality concrete your customers demand!

For your *profit's sake* . . . for your *customer's satisfaction* . . . . get the best . . . . get Rex Adjusta-Wate Moto-Mixers!

Only REX Adjusta-Wate Gives You All These Advantages . . .

Here's Why You're Miles Ahead...

GREATEST FLEXIBILITY IN CHOICE OF TRUCK . . . that means more money in your pocket. Only Rex Adjusta-Wate permits you to choose a truck for most economical operation . . . and still retain maximum legal pay loads. Adjusta-Wate principle places load center of gravity closer to front axle so all axles can be fully loaded. You save money at the start . . . and finish way ahead.

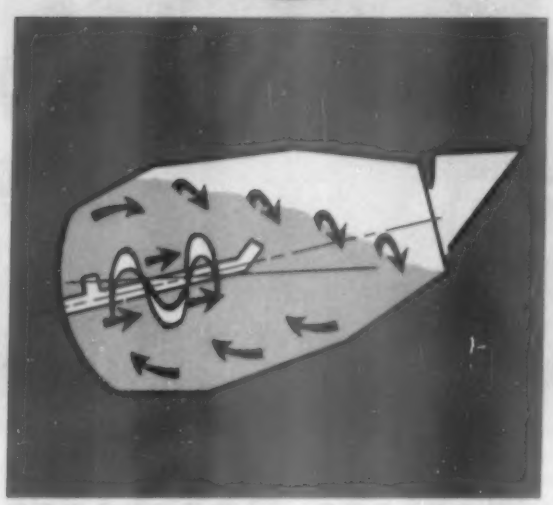


GREATEST MANEUVERABILITY . . . Adjusta-Wate principle permits mounting the mixer on a shorter wheel base truck. This big advantage means you get out to the job faster . . . you get to the forms in less time. You have less trouble in traffic, get in and out of the job site faster, cut delays on the job and make more trips per day.

FASTER CHARGING . . . saves those important minutes every charge that helps make more trips per day possible. No time- and dollar-wasting delays. And there are three different fast-charging options to suit any operator's convenience . . . (1) *open end hopper*, (2) *sealed hopper*, (3) quick-opening, top-charging hatch.

Before You Buy Any Truck Mixer . . . Compare REX

with REX Adjusta-Wate...



FASTER, COMPLETELY THOROUGH MIXING . . . probably the most important "must" on a truck mixer. With the Rex Adjusta-Wate lowest drum incline and exclusive-design mixing blade, you'll meet any "spec" for quality mix . . . *and do it in less time!* You'll have no customer complaints on concrete quality with Adjusta-Wate.

FASTER, COMPLETE DISCHARGE . . . or a controlled rate for narrow, small forms. You get them both with Rex Adjusta-Wate. Regardless of the type and speed of discharge required, you're finished *faster* with Rex Adjusta-Wate. Finger-tip control means you fill the narrowest, smallest forms without spillage . . . keep customers happy!

MAXIMUM DISCHARGE RANGE . . . your truck wheels will not restrict your spouting range with a Rex Adjusta-Wate. Adjusta-Wate principle, with engine mounted at rear of drum, permits mounting on the truck for most favorable weight distribution, and still keeps the discharge point well behind the rear tires. That means a substantial increase in spouting range.

Adjusta-Wate ON PRICE...ON PERFORMANCE

To Serve the Needs of Western Operators The Cal-Rex Adjusta-Wate

To more efficiently serve the needs of western Ready-Mix operators, the Los Angeles Plant of Chain Belt Company offers the Cal-Rex Adjusta-Wate Moto-Mixer.

This efficient mixer incorporates all the exclusive Adjusta-Wate features that add up to more trips per day and per season . . . more profit for you . . . better quality concrete for your customers.

REX Horizontal and Adjusta-Hite Moto-Mixers

Built to the same top-quality standards as the Adjusta-Wate Moto-Mixers, these efficient, dependable machines assure unequaled performance. The Adjusta-Hite combines the advantages of a horizontal truck mixer with the high-discharge point of a high-discharge machine. Exclusive Rex Hydraulic System elevates the mixer body to the desired discharge position. It's a horizontal . . . it's a high-discharge . . . it's any point in between.

For the complete cost-saving story on the Rex Moto-Mixer line, see your Rex Distributor or write CHAIN Belt Company, 4695 W. Greenfield Ave., Milwaukee 1, Wis. There is a Rex Distributor in:

Albuquerque, N. M. • Atlanta, Ga. • Augusta, Ga. • Baltimore, Md. • Barre, Vt. • Beltsville, Md. • Binghamton, N. Y. • Birmingham, Ala. • Boise, Ida. Buffalo, N. Y. • Butte, Mont. • Casper, Wyo. • Cedar Rapids, Iowa • Center-Green Island, N. Y. • Charleston, S. C. • Charleston, W. Va. • Chattanooga, Tenn. • Cheyenne, Wyo. • Chicago, Ill. • Cincinnati, Ohio • Clarksburg, W. Va. • Cleveland, Ohio • Columbia, S. C. • Columbus, Ohio • Concord, N. H. Dallas, Tex. • Davenport, Iowa • Denver, Colo. • Des Moines, Iowa • Detroit, Mich. • Duluth, Minn. • El Paso, Tex. • Eugene, Ore. • Fairport, N. Y. Grand Rapids, Mich. • Great Falls, Mont. • Greensboro, N. C. • Greenville, S. C. • Harrisburg, Pa. • Hartford, Conn. • Houston, Tex. • Iron Mountain, Mich. Jacksonville, Fla. • Jamaica, N. Y. • Kansas City, Mo. • Knoxville, Tenn. • Lexington, Ky. • Little Rock, Ark. • Longview, Tex. • Los Angeles, Cal. • Lubbock, Tex. • Luckey, Ohio • Macon, Ga. • Melrose Park, Ill. • Memphis, Tenn. • Miami, Fla. • Milwaukee, Wis. • Minneapolis, Minn. • Nashville, Tenn. Newark, N. J. • New Orleans, La. • New Philadelphia, Pa. • Newton Highlands, Mass. • New York, N. Y. • Norwalk, Conn. • Oklahoma City, Okla. • Omaha, Neb. • Owensboro, Ky. • Paducah, Ky. • Philadelphia, Pa. • Phoenix, Ariz. • Pittsburgh, Pa. • Pocatello, Ida. • Portland, Ore. • Reno, Nev. Richmond, Va. • Roanoke, Va. • Rockford, Ill. • St. Louis, Mo. • Salt Lake City, Utah • San Antonio, Tex. • San Francisco, Cal. • Seattle, Wash. • Shreveport, La. • Sioux Falls, So. Dak. • So. Portland, Me. • Spokane, Wash. • Springfield, Ill. • Syracuse, N. Y. • Tampa, Fla. • Washington, D. C. • West Palm Beach, Fla.

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PREVENTIVE Maintenance In the Ready-Mixed Concrete Industry

28: A producer views the ready-mixed concrete business. Third article of series on preventive maintenance

By JAS. A. NICHOLSON*

THE FOUNDATION for a functioning preventive maintenance program begins with the setting up and carrying out of effective lubricating procedures. A producer makes the first start toward maintenance efficiency when he demands that all truck mixers be kept clean — inside and out. An operator begins to lick his top cost — replacement and maintenance problems, when he puts into effect a realistic, thorough tire-care program. It is fundamental that without capable, industrious and conscientious (operation and maintenance) employes, a producer isn't going to get beyond first base with cleaning, greasing and tire-care efforts. Efficiency comes when carefully selected, highly trained personnel carry-out effective operating and maintenance procedures.

In a talk on "Maintenance," recently given before the Empire State Ready Mixed Concrete Association, Bob Bremner, sales manager of the T. L. Smith Co., told of a visit to a completely equipped, fully automatic ready-mixed concrete plant. Everything about the plant was perfect. An inspection of the truck mixers produced a different story. Interiors of "beaten-up" drums were loaded down with hardened concrete and mixing blades were worn down to a condition where efficient mixing was simply impossible. Several old drums were garaged for repair with one unit down because hardened grout had frozen the rollers tight and the revolving drum had worn flat spots on them. The efficiency of the plant failed to impress Bob who could only think of $100 for a new pair of rollers, unnecessary downtime, effect on concrete quality and the shabby appearance of truck mixers.

It seems incredible, but hundreds of producers (many without the efficient plant) are operating under similarly unsatisfactory conditions. Too many in our industry are still unmindful of costs, appearance, quality and efficiency.

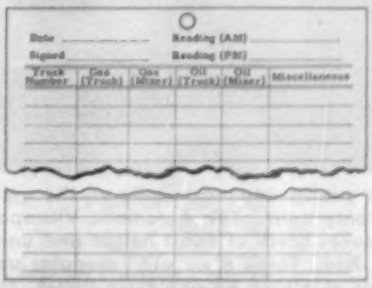
Cleaning

A major problem around all ready-mixed concrete operations concerns the establishment of procedures to keep equipment clean, with the care of truck mixers of special significance. While truck mixer appearance is an important consideration, other factors are involved, including proper operation, processing of quality concrete and freedom from breakdown.

It actually costs money to keep truck mixers dirty. In a tough competitive market, a producer cannot afford this unnecessary expense. A dirty mixer means higher maintenance costs, additional repair bills, more breakdowns, earlier replacement of mixers, production of inferior quality concrete, smaller payloads, interference with proper customer relations, loss of goodwill and the missing of a real opportunity to effectively advertise the product of a ready-mixed concrete company. Yet, there are some producers who admit that they don't take corrective action until there is a ½-cu. yd. (or more) buildup inside the mixer drum.

In making deliveries, splashed concrete gets all over trucks and mixers. In loading, cement gets on painted surfaces of the unit, the charging fins of the mixer are subjected to build-up. In discharging loads, build-up generally starts around the mixing blades, on the back side of the fins, in the discharge hopper and on the chute. Inside and out, the mixer should be kept free of any adherence of mortar, concrete and cement.

We have already made reference to two "musts" for every ready-mixed concrete plant: (1) an oil spray, and (2) a high pressure hose. For coating with form oil, (a mixture of paraffin oil and diesel oil) a simplified paint sprayer, using a single nozzle and air pressure at line pressure, is entirely adequate. In place of form oil, several commercial products, (e.g. Dupont's Spray Glaze Polish and Spray Glaze Cleaner) have been successfully used by producers in maintaining the appearance of truck mixers. As minimum washing equipment, the high pressure hose should be a 1½-in. or 2-in. hose, equipped with a tapered nozzle, working on a 2-in. or larger high pressure water line. Where water pressure is not sufficient to eliminate the problem of excessive wash water, producers employ special high pressure pumps to obtain satisfactory results. Commercial pumps, adequate for the task, cost in the neighborhood of $1000. Some producers have assembled completely satisfactory units at a total cost of several hundred dollars.


Date _____ Reading (AM) _____
Signed _____ Reading (PM) _____

Truck Number	Gas (Truck)	Gas (Mixer)	Oil (Truck)	Oil (Mixer)	Miscellaneous

Daily gas and oil *record* kept for each mixer truck unit at Hilltop Building Materials, Inc., Cincinnati, Ohio

Many producers now daily spray all their concrete trucks. Some also spray both the truck and mixer engines. Other producers even spray their truck mixers more frequently than once a day. One producer reports washing and spraying the mixers after each trip. Under average operating conditions, satisfactory results can be accomplished through daily spraying although washing may necessarily have to be done more frequently.

To prevent concrete or grout build-up, the mixer-mounted hose should be used after each unloading to wash off the front side of the charging fins, stationary spout, swivel chute, inner seal or any splashings to the truck mixer's rollers, brackets and frames. When a truck mixer is discharging into a concrete bucket, extra care must be taken after each load to clean up the equipment. On deliveries using truck mixers equipped with door seals, it is vitally important, after discharging each load, that the driver should flush the seal free of grout. With a build-up of grout on the seal, a resultant binding action will cause a short life for the seal. Many operators rate the seal maintenance problem of No. 1 concern. With proper care, the life of a seal can be doubled. Such consideration represents important savings.

After each unloading, the driver's

(Continued on page 193)

Pres. Nicholson Concrete Co., Toledo, Ohio.

Besser Automatic Vibrapac

Gives You MORE!

The growth of the concrete block industry coincides with the growth of the Besser Manufacturing Company. 50 years ago, Besser made the first concrete block machine. Since then, the company has devoted its constant and untiring efforts to producing better block machines, pioneering new types and improving production methods. Today — the Automatic Vibrapac is the result of that half-century of pioneering and developing. The machine gives you MORE . . . more power, more smoothness, more ruggedness, and, what every block plant operator is primarily interested in, more block production. No doubt about it — the Automatic Vibrapac is the world's leading concrete block machine — a PROFIT MAKER for block plants everywhere.

BESSER MANUFACTURING CO. • Box 135 • Alpena, Mich., U.S.A.

MORE power

The Automatic Vibrapac provides unidirectional vibration from two 10 horsepower, high starting torque vibrating motors — DOUBLE the horsepower of any other block machine.

MORE production

The famous Besser cam and roller principle assures maximum block production. The slow revolving cam, with a roller riding on its surface, delivers power with pin point precision and with steady, uninterrupted regularity.

MORE smoothness

The Vibrapac is equipped with gravity actuated block moving weights which assure much smoother delivery of the finished block at high speeds.

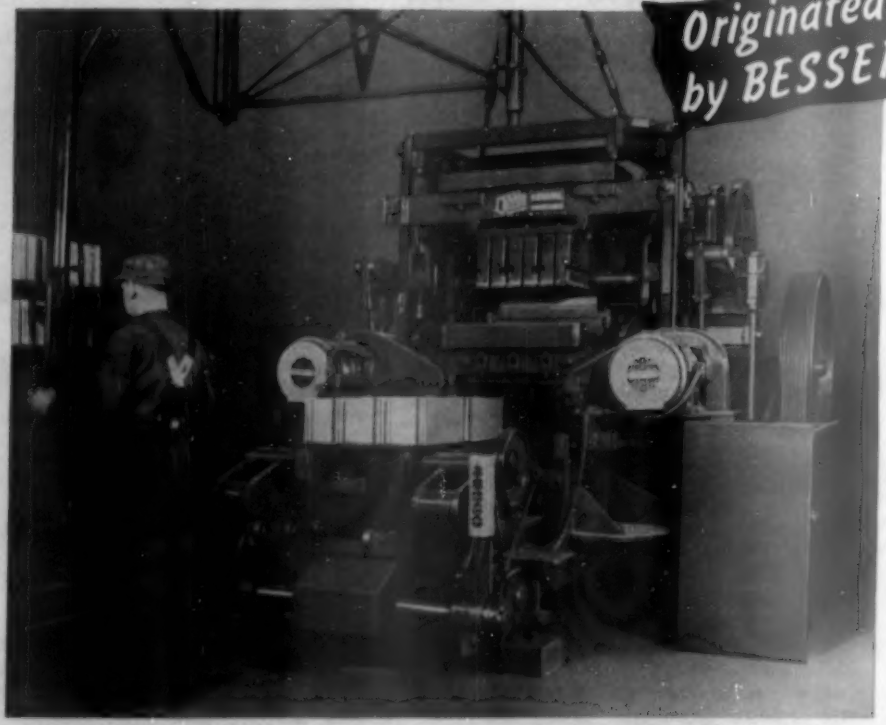
MORE ruggedness

The machine frame of the all-steel electrically welded Vibrapac is made of 1½" thick steel—almost unbelievable, but it's a fact. That's why the Vibrapac is able to produce block, day-in and day-out, without interruption — for YEARS.

Watch VIBRAPACS Work

Step into any Vibrapac block plant and see high quality block made, automatically. Notice there are no lost motions and no time is wasted. Pallets and mixed materials are fed automatically. As block are completed, they are quickly transferred to the racks. No manual lifting. Off-bearer merely guides the power hoist.

Vibrapacs are versatile. They make ALL types and sizes of high-quality masonry units on ONE set of Plain Pallets. Vibrapac Block are specified by progressive architects — used by leading contractors—produced and sold by leading concrete products plants.



Your profits depend largely on the uninterrupted production of high quality masonry units. The Automatic Vibrapac enables you to reach this goal. It produces block of exact height and uniform density on a continuous production line. Three 8"x8"x16" modular units (or equivalent in other sizes) are made at a time on one Plain Pallet. No machine operator is required.

BESSER
50th Anniversary
1904-1954

A Half Century of Concrete Masonry Progress!

Preventive Maintenance

(Continued from page 191)

attention should also be directed to washing grout away from the trunnion roller of the mixer. If grout is permitted to accumulate and harden around the roller bracket, the roller track will wear a flat spot on the roller, leading to sizable repair and replacement expense.

Spraying daily with oil, suggested washing after each unloading and a thorough cleaning (back at the plant at the end of each work day) with a high pressure hose capable of removing semi-hardened concrete and grout, will normally take care of a truck mixer on the outside.

On the inside of drums, thorough daily washing with the high pressure hose will not be sufficient. When the mixer is delivering low slump concrete, the unit must be cleaned after each trip. If this is not done, the mixer, by the end of the day, will be in terrible shape. The mixing of high air content concrete also adds considerably to the cleaning problem.

Drivers of high discharge truck mixers should be alerted to the possibility of concrete build-up in the lower half of the drums. In drum interiors, the employment of a scraper or small air hammer may be necessary to remove build-up around mixer blades, fins and other parts. The use of a regular hammer should not be permitted as a cleaning aid for resulting dents will only mean future trouble.

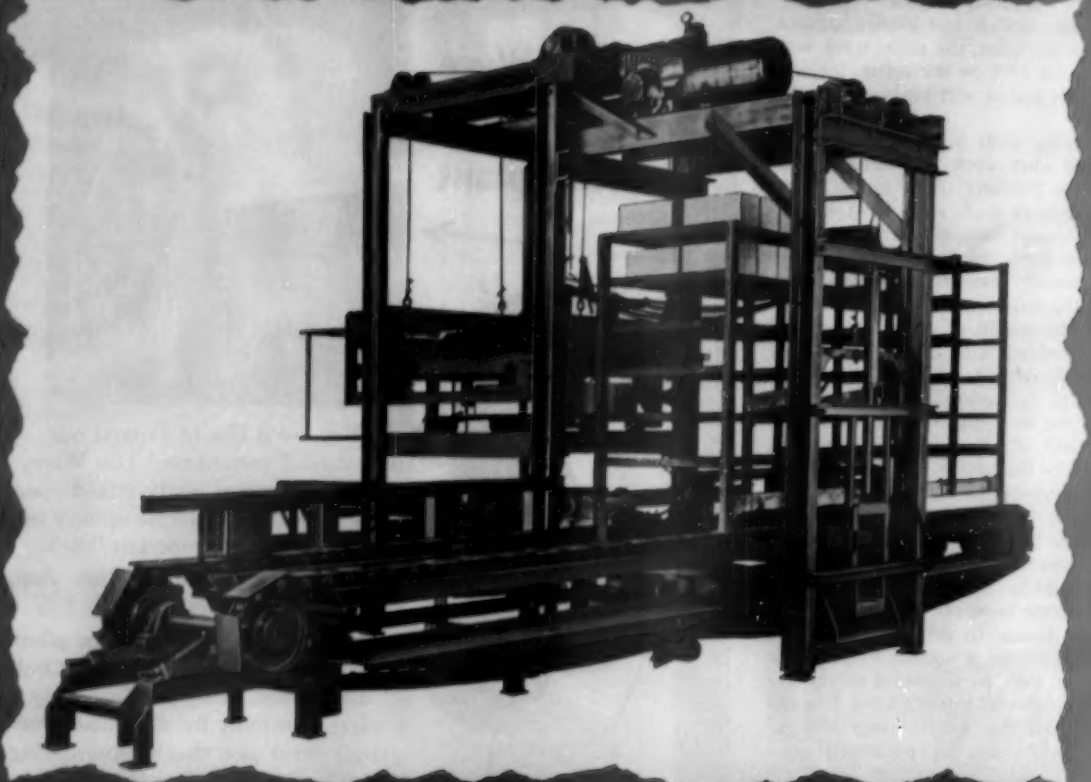
To effectively keep concrete and mortar from building up inside the mixer drum, to a condition where drum capacity is lessened and mixing impaired, give the unit complete daily cleaning, coupled with concrete removal. The important point in drum interior cleaning is the amount of elbow grease supplied by a conscientious, determined driver or service employe.

Producer Responsibilities

In two important ways, a producer can help drivers care for their equipment: (1) by not overloading closed end mixers; and (2) by working out the most effective charging procedures. A producer who overloads mixers equipped with closure seals is almost certain to have aggravated seal expense. By operation of an overloaded unit, with the seal riding in concrete, a producer is just looking for trouble. Where overloading is a common practice, an extra closure seal should always be kept on hand.

The problem of proper charging procedures may start with the selection of the mixing unit. The mixer selection decision brings into question the "pro's" and "con's" of top-hatch

NOW AN AUTOMATIC RACK LOADING DEVICE . . . FOR YOUR BLOCK MACHINE!



*RACKMAN by GOCORP

RACKMAN AUTOMATICALLY removes green blocks from your block machine and indexes them gently onto the decks of the rack.

RACKMAN AUTOMATICALLY removes empty pallets and returns them to your block machine front pallet feeder. Automatic front pallet feeder may be added as an optional extra with RACKMAN.

RACKMAN AUTOMATICALLY shifts racks. Your lift truck operator merely places racks with empty pallets on conveyor and removes loaded racks.

RACKMAN AUTOMATICALLY removes cured blocks, *if you wish.* With additional equipment, RACKMAN will automatically remove pallets of cured blocks and convey them to your cubing station as it indexes green blocks into the rack. Empty pallets return automatically to the block machine.

CONTINUOUS AUTO-OPERATION is provided by RACKMAN keyed directly to the cycle of your block machine. Increases daily production.

AVAILABLE NOW for use with most high-production plain pallet block machines.

NO PITS REQUIRED—RACKMAN is entirely above the floor.

MOST PLANTS have ample room for installation.

TESTED AND PROVED in actual plant installations.

*Trademark—Pat's Pending

WRITE TODAY FOR DESCRIPTIVE LITERATURE AND COMPLETE INFORMATION

OTHER COST CUTTING GOCORP EQUIPMENT

Concrete Block Machines both plain and cored pallet types • Batch Mixers—12-75 cu. ft. • Block Cubers • Skip Loaders—to match mixers • Magnetic Offbearing Hoists • Other Supporting Equipment

GOCORP
ADRIAN-MICH.

407 Grace Street Adrian, Michigan

loading and cone-charging. The claim for cone-charging is that this operation is quicker and cleaner. While the gain in speed claim definitely does not hold equally true for all makes of truck mixers, it is certainly a fact that in top-hatch loading, the whole mixer is more exposed to dirt, cement dust and accumulations from the weigh hoppers.

In passing, it is this additional exposure to cement grout, etc., plus added backing-up hazards, that make me skeptical of the recent trend toward mounting the mixer engine on the rear side of the truck — in spite of some slight gain in load capacity.

Some producers, through incorrect procedures in loading truck mixers, actually cause unnecessary build-up around the charging fins. If such build-up is occurring, it is good practice to require drivers to regularly use a brush around the door and the front side of the fins. An operator is on dangerous ground when, after a mixer has been loaded, he permits drivers to use a hose on the fins and the back side of the charging door. This indefensible practice rules out any possibility of close control over water and slump.

In charging a mixer, whenever possible, it is advisable to have the water introduced from both front and back ends of the unit. This procedure will be helpful in keeping the mixer drum clean throughout.

A popular procedure, in charging mixers, is first to put in approximately one third of the water, then ribbon feeding of aggregates, cement and some water with the cement all in before aggregate charging is completed and the balance of the water coming in at the end. With both aggregates and water going in last, the charging fins are given a good scouring action.

Individual plant procedures for charging truck mixers vary greatly. Producers take into consideration speed of operation, problem of cement balls and the matter of attempting to keep the mixers clean. The problem at dry batching plants differ from those encountered at central mixing operations.

One Midwest producer, differentiates in charging methods between closed and open end mixers.

(A) *Closed-end mixers* — Water is started first, then sand, stone and cement are ribbon fed. Water charging and cement introduction are completed with sand and stone finishing up to scour the fins. On the job, the mixer drum is reversed for a few revolutions before discharging in order to knock off material that might have collected on the fins.

(B) *Open end mixers* — The same general procedure is followed in charg-

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Preventive Maintenance

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ing these mixers except that 50 to 60 gal. of water are held back to be introduced after all other materials have been charged. This water serves to wash off any dry material that has become attached to the front side of the fins.

An Ohio operator, who has experienced serious difficulties over the formation of cement balls, uses this procedure in charging truck mixers: All water is added first, followed by a comparatively small amount of sand and gravel. Then all the cement is introduced. Finally, the balance of sand and gravel is added. This practice has overcome "balling" and has also assisted greatly in preventing a build-up on the fins.

If the mixing action is more rolling than crushing, the truck mixer itself may contribute to concrete build-up and cement ball formation. Some mixer manufacturers might suggest the use of the reverse as an aid to mixing — because of the shape of the drum and the type of mixing action. Other manufacturers of transit-mixers are opposed to using the reverse either to mix concrete or prevent build-up. They instruct operators of equipment to use the reverse only for discharging the load.

In the over-all cleaning problem, special consideration must be given to the rubber diaphragm at the end of the water line. This piece of equipment must be kept scrupulously clean. Mortar must be prevented from backing up into the water line. Checks (at least weekly) should be made of the water outlets to make certain that clogging is not imminent. In the drum, any accumulations around the water nozzles should be removed. If the build-up occurs here, there will be a tendency to "block-up," causing the hose to burst with operation of the pump.

On job hold-ups, in case of truck mixer breakdown, or a flash set of the concrete, there is always the possibility of a real cleaning job on the drum interior, with hardened concrete to be removed at great cost. The hardening of a load within a mixer is a wasteful, generally sinful expense. The danger of hardening may come from a breakdown. If the breakdown does not prevent revolution of the drum, water should be added. If the breakdown is complete, the driver should attempt to promptly remove the concrete through the emergency door. If the mixing unit is not equipped with an emergency exit, effort should be made, before hardening is imminent, to push sugar (10 lb. or more) through the load.

(Continued on page 199)

RAISE your efficiency factor...

With A Concrete Plant Designed And Built By Fanning-Schuett

The efficiency factor built into your concrete plant practically determines the economy of its operation. Therefore, every concrete plant and all the equipment in it should be designed to achieve top efficiency and built rugged and sturdy enough to meet the exacting demands of long service life.

For just these reasons many of the nation's top concrete plants bear the Fanning-Schuett label.

WARNER COMPANY'S Central Mix Plant at 51st Street and Schuylkill River, Philadelphia, Pa. Comprised of 3 cu. yd. mixers, 4 aggregate bins and 2 cement bins. Materials are delivered to bins by 30" belt conveyor and the 2 storage bins for cement are served by a large capacity screw conveyor with a super capacity vertical bucket elevator. Another Fanning-Schuett installation.

WARNER COMPANY, Philadelphia, Pa. This battery of conical bins is part of a huge loading facility. Bins may be charged with a gantry crane or conveyor. Material is discharged through openings controlled by large gates to waiting trucks below.

FANNING-SCHUETT JOBS IN PROGRESS

For **SUSQUEHANNA SUPPLY CO.,** Williamsport, Pa. Enlarged bulk cement storage facilities.

For **JAMES J. SKELLY, INC.,** Media, Pa. Cement storage and handling equipment and 3 compartment batching bins.

For **WEL-DON CONCRETE CO.,** Westfield, N. J. New Central Mix Plant with large storage bin and 24" trough type conveyor.

For **KERN-O-MIX, INC.,** So. Orange, N. J. Additional storage capacity for ground lime; unloading machinery, storage bins and screw conveyor.

For **DELRAN CONCRETE CO.,** Riverside, N. J. Two large inclined belt conveyors.

For **HERBERT HINCHMAN & SON,** Little Falls, N. J. Enlarged cement storage facilities.

FORMIGLI BROTHERS, INC., Berlin, N. J. A concrete "products" plant. Principal items are roof slabs, floor slabs, concrete girders for highway bridges, etc. Design, fabrication and erection by Fanning-Schuett.

FANNING-SCHUETT ENGINEERING COMPANY
4325-30 NORTH THIRD STREET PHILADELPHIA-PENNSYLVANIA

Another BESSER Booster*

★ This is the 118th of a series of ads featuring leaders in the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

4 Jensen Brothers Unanimously Endorse VIBRAPACS for Concrete Block Plants

The Jensen Block & Supply Company of Racine, Wisconsin began to make concrete block in 1928. Their first Besser machine, a K-3 Tamper, was installed in 1939. Then came the Besser Vibrapac, in 1947, and this machine is still giving them excellent service.

The Jensen plant is being operated by four brothers. All four are of the opinion that the Besser VIBRAPAC is the "best machine on the market". Why? Because the VIBRAPAC has practically *no downtime*. It operates day-in and day-out, thereby assuring maximum volume production.

The Besser VIBRAPAC can do the same for YOU. Get the facts! Write today for literature.

BESSER COMPANY • Box 135 • Alpena, Michigan, U. S. A.

Complete Equipment for Concrete Block Plants

The Jensen executive team — brothers Roy, Paul, Ken and Harold.

Funeral Home in Racine built with beautiful BES-STONE Split Block produced at the Jensen Block and Supply Company plant.

BES-STONE

The Split Block with Character

The Jensen plant recently installed a BES-STONE Block Splitter to meet the ever-increasing demand for BES-STONE — the split block with a quarried stone appearance. It combines beauty with permanence, at low cost.

Yard scene at the Jensen Block & Supply Company plant. In addition to conventional block, Jensen produces precast lintels and sills . . . brick . . . chimney block . . . wall coping and manhole block.

BESSER
50th Anniversary
1904-1954

A Half Century of Concrete Masonry Progress

Preventive Maintenance

(Continued from page 196)

Sugar will prevent the concrete from hardening. The load will be lost but a considerable cleaning and air hammering expense will be avoided.

In care of delivery equipment, there seems to be a great deal of merit in the policy of holding a driver responsible for the condition of his unit. A few operators have attempted to use regular "washing- out" employes in both a serious and economic attempt to keep truck mixers in shape. In keeping delivery equipment clean, the necessary interest of such employes is generally not there. A number of producers hold drivers responsible for the appearance of their cabs and preliminary washing of the drums with the remainder of the work completed by night employes who also grease, oil and gas. Some who use these procedures report excellent results. However, in the over all, placing complete responsibility for maintaining a clean truck mixer in the hands of a dependable driver seems to be the preferred method.

New Lightweight Block

THE UNIVERSITY OF TENNESSEE Agricultural Experiment Station has announced the development of a new type of lightweight concrete block designed for use with a simple adhesive instead of the conventional sand mortar. The block reportedly was developed in research to find materials and construction methods to bring greater economy, permanence and safety into rural housing.

The new block is made of expanded shale aggregate, and designed to use a minimum of material. The top and bottom of the block are ground smooth, straight, and parallel, making it possible to apply the adhesive with a paint brush or an oil can. With the bottom course of block laid straight and level on the foundation, the adhesive can be applied and a block placed in position in about one minute, reducing costs considerably, according to U. T. engineers.

A home designed for use of these block is to be built by the Experiment Station to study construction methods and obtain cost records. The house will have a flat roof, with the ceiling joists serving as rafters and small concrete slabs placed on the rafters.

Zonatile Franchisee

NEVILLE CONCRETE PIPE CO., Neville Island, Penn., has been franchised by the Zonolite Co., Chicago, Ill., to manufacture Zonatile reinforced lightweight vermiculite roof tile. The company will serve a 150-mile radius of Pittsburgh, Penn., under the franchise.

Unusual Uses of Concrete

(Continued from page 180)

This treatment is said to be particularly good where a terrace surrounds a play area, lawn or pool.

No. 7 is a concrete seat surrounding a tree which is very decorative in a garden. However, provision has to be made to give sufficient room for tree growth.

No. 8 shows how one home owner got an unusual effect by laying narrow strips of wood "hit and miss" when the concrete was poured.

Package Steam Generators

(Continued from page 184)

and performance under all conditions of load and operation.

Because of such modern design, package units on the average show a consistent fuel saving of 25 percent, year in and year out.

They require less floor area and less building space. Mounting them on the tops of kilns takes them out of the way and makes it possible to take best care of them. Package units may be picked up and transported to other locations with no cost except that of transportation and making new connections. Their efficiency of operation is as good in the small sizes as in the large sizes. Thus, it becomes possible for a block plant to have two, three or four separate units, with high operating efficiency and performance. Thus they permit greater flexibility of operation.

Present Gift to University

DR. JOHN T. RETTALIATA, president, Illinois Institute of Technology, recently announced a gift of a quarter million dollars to I.I.T. from Dr. Edward A. Crown, Irving Crown, Col. Henry Crown, and Material Service Corp., Chicago, Ill. The money is to be applied to financing the construction of a new $750,000 campus building which will house the institute's departments of architecture, industrial design, and city planning. According to Dr. Rettaliata, Col. Crown volunteered this gift "to lend assurance to our plans for the building, and in the hope that it would persuade others to give generously toward expanding the facilities of the city's only architecture and industrial design school."

Col. Crown is a member of I.I.T's board of trustees. He is chairman of Material Service Corp. and of the Empire State Building Corp., and is also a member of the executive committees and director of the Hilton Hotels corporation and the Chicago, Rock Island and Pacific Railway, as well as an officer or director of a half dozen other prominent corporations.

Ready-Mix Review

(Continued from page 186)

"We do produce lightweight concrete. Material should be pre-wetted at point of shipment, and ready-mixed concrete producers should check unit weights frequently. A small percentage of sand and air entrainment should be specified generally for workability.

"We installed two plants last year and 16 mixer trucks. Yes, we plan future expansion. We use two-way radios, and for the short time we have had it, we feel that it is helpful; however, we have not been able to convert the expenditure on the two-way radios into a tangible saving. This can be done with time. Seven entirely new operations have come into this area within the past year.

"The principal handicap is the general shopping of bids by some of the general contractors, which results in an unstable pricing situation with the number of new plants that have come into this area.

"These few general contractors seem to fail to realize that their method of competitive bidding is a distinct advantage over our method of competitive bidding. Generally when he is low man, it is his job. There is no further shopping of the architects or owner for a better price; whereas, the minute the job is awarded to him, it is a signal for the chiselling to start among the building material dealers. Naturally, a new building material dealer coming into this area is a sitting duck for a hint from the general contractor that his prices are considerably higher than his competition; therefore, he is stampeded to a lower price, which didn't exist in the first place. The rest of the building material dealers are forced to either lower their prices to get the job or let a new man have it with the possibility that he might lose money. In short, if these few general contractors would give the building material dealers the same chance at being the low bidder as they have, prices would certainly become more stable in building materials as well as bidding."

Concrete Products

OHIO: "Our volume of business for 1954 showed an increase of 16 percent. Commercial work is up about 10 percent.

"To meet competition we have done more promotion and considerable more work in service of customer relations this year than the previous years.

"We find very few handicaps in doing business. Our firm is in its 44th year of business and is managed by the second generation. We have a good efficient organization composed

chiefly of comparatively young people, particularly in the administration end. In the production end, we have everyone on a piece work basis with the exception of the plant superintendent and the foreman. We feel this has played a very important part in cutting our cost of production."

"One of the most serious handicaps to doing business at present is that many contractors, both general and mason, are not properly financed and with stiffer competition, credit terms are often over-extended. In addition, there is always a small number of new contractors, who are not competent to run a business and who should be working for someone else."

NORTH CAROLINA: "Volume was a little higher and prices were a little lower in 1954, outlook for 1955 is good.

"State school work and public buildings are 80 percent of the total and the school building program and that of state institutional buildings will continue.

"We are trying to invade the small warehouse type of construction with an all precast concrete frame construction. Prestressed concrete is a product we are starting to push.

"Markets are very competitive and more advertising is contemplated to keep products before the architects.

OHIO (silo manufacturer): "The business in 1954 compared favorably with that of 1953, and the outlook for 1955 looks very good. Farm silo and industrial bin business went through on about the same percentage as in previous years. As industrial bins sell for much more money than that of the farm silos, naturally, the dollar volume is greater. We do not do any residential construction work.

There is always something new coming up to change the use of our product. For instance, in the farm silo division, a few years ago we did not know we could put hay in silos and make good feed out of it. We looked upon corn as being the only product to be used in a silo. Today we have a greater demand for them for ensiling hay than there ever was for the use of corn."

Concrete Housing Project

THE MARIETTA CONCRETE CORP., is constructing "Marietta Homes," in Welwyn Park, West Hollywood, Fla., which are built exclusively of the company's concrete products. The walls are of mortarless, concrete block construction, and the roof and interior partitions are built of precast concrete slabs. The homes have two bedrooms and a bath, and are designed to sell for $6,700.

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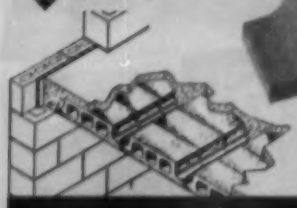
MORE PROFIT FOR YOU with SOFFIT BLOCK

(Floor Filler Block)

Modern Soffit Filler Block floors and roofs meet building code standards . . . endorsed by architects and builders . . . ideal for radiant heat systems . . . many other advantages!

MAKES FLOORS and ROOFS permanently FIRESAFE, RIGID, ECONOMICAL!



Section of Soffit Filler Block floor, showing integral joist and slab of reinforced concrete.

You can make them on this BESSER VIBRAPAC

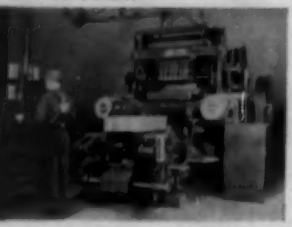
Soffit Filler Block, as well as all styles and sizes of concrete load-bearing block, are made on this same machine, with one set of Plain Pallets.

Write for Bulletin No. 77

BESSER COMPANY

ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Block Plants



POSITIVE QUALITY CONTROL with NEPTUNE WATER METERS

Simplest, surest way to get consistently better ready-mix batches is *accurately metered* water . . . with a dependable, long life Neptune water meter. Easy to read, saves space, speeds loading, and reduces structural requirements. Your choice of two types: Auto-Stop meter which automatically shuts off the water at exactly the right amount, or manually controlled round-dial meter. Write today for full details.

PRP

NEPTUNE METER COMPANY, 19 West 50th St., New York 20, N. Y.

Branch Offices: ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER • LOS ANGELES • LOUISVILLE • NO. KANSAS CITY, MO. • PORTLAND, ORE. • SAN FRANCISCO

Do you use LIME PROOF COLORS?

If you concern yourself in any way with the coloring of mortar, cement, concrete, or stucco, we would like to send you our new folder of color chips and formulations. There is no obligation on your part whatsoever.

IRON OXIDE JLS PIGMENTS

Established 1854

J. LEE SMITH

and Company, Inc.

25 ANN ST., NEW YORK 38, N.Y.

PLANTS:

Hiwassee, Va. Pulaski, Va.

— Sh-s-s-h! —

Are you open to deal in lucrative

Underground Activities?

BIG PROFIT MANUFACTURING Cement Drain Tile

Farm drainage — home building — reclamation projects — highway construction. From these and other sources comes an ever-growing demand for drain tile. More local plants are urgently needed.

It's a wide-open opportunity. Either as an independent, full-time business or as a profitable addition to other concrete products.

CHAMPION Drain Tile Machine

Champion-made tile are dense, strong and truly round. Far superior to clay tile —worth more but can be sold for less without sacrifice of profit.

Champion machine makes manufacturing easy. With automatic feeder it becomes 1-man operation. Makes all sizes up to 12", yet requires only a modest investment. *Write for catalog*

W. E. DUNN MFG. CO.

528 W. 24th Street, Holland, Mich.

CANADA: Dunn Masonry Machinery, Ltd. 978 Dundas H'way, Cooksville, Ont.

WHERE TO BUY

BLOCK PLANT SUPERINTENDENT WANTED

We need a block plant superintendent to handle the maintenance of a Besser Super-Vibrapac Machine, and other allied equipment, such as Clark Fork Trucks and Champion curing equipment. Our total annual production is about 1,500,000 blocks. We want a man who has had block plant experience, is honest and believes in a quality product, and can operate a plant as efficiently as it should be. If you qualify, we guarantee that you will be satisfied with the contract we offer.

BOWDEN CONCRETE PRODUCTS
2175 E. PERSON AVENUE, MEMPHIS, TENN. PHONE: 4-7345

BLOCK MACHINE & EQUIPMENT

1—Lith-I-Bar L-3 Block Machine 4", 6", 8" and 12" Attachments
1—Chimney Block Mold
1—8" two-core Mold
1—Brick Attachment, Corebar Assembly, Liners, Cores and Shoes
1—Pallet Return
1—Pallet Cleaner
1—Syntron V-25 Vibrator and Control Switches
2—Hydraulic Pumping Units with 25-HP Motor 220-950 R.P.M.
1—½ HP Gear Head Motor, Reductian Pinion and Hall Wheel
1—3 HP Gear Head Motor
1—Gardner Denver 35 C.F.M. Compressor
800—Steel Pallets 18"x30"x1¼" and racks

TOTAL PRICE — $6,000.00

This equipment is located on the West Coast.

FOR INFORMATION CONTACT—

COLUMBIA MACHINE WORKS
VANCOUVER, WASH.

FOR SALE

4500—8 x 8 x 16 "BABA" Pressed Steel Pallets.
1500—12 x 8 x 16 "PARADOX" Pressed Steel Pallets.
6000—4 x 8 x 16 "ZONAL" Pressed Steel Pallets.
1500—8 x 8 x 16 "BATON" Pressed Steel Pallets.

No reasonable offer refused.

1—Barrett Hand Lift Truck.
1—Bonded Cinder Crusher.
½ Yard SAUERMAN HIGH LINE ASSEMBLY. Complete with 82 feet Mast, New ½ yard Bucket, all Guys, Cables, Sheaves, 2 Speed Winch, 50 HP Motor, V Belt Drive.

ATHENS BUILDING MATERIALS CO.
North McKinley Avenue P. O. Box 199
Athens, Ohio Phone 3-1866

Plant Layout Design Block Machinery

WITTEMANN MACHINERY COMPANY
FARMINGDALE, NEW JERSEY
Specialists in Concrete Products Equipment
Eastern Representatives of the
COLUMBIA MACHINE WORKS, Vancouver, Washington

Elevators Bins Conveyors Feeders

GOOD WILL BUILDERS

For the block manufacturer. Help your contractors and bricklayers get quicker, easier and straighter masonry construction with U.B. tools that carry YOUR advertising. U.B. Corner ties Linestretchers, Line Pins and Twigs. We also wholesale a full line of tools for the block layer. Write for catalog and prices.

UNITED BUILDERS
1822 Lindberg Drive
Muskegon, Michigan

FOR SALE

One only C. S. Johnson Aggregate Elevator 60 T. P. H., single strand chain type 110H, crows nest and spouting to pivoted distributor, 10 HP electric drive. Elevator height approximately 70 feet from center of shaft to center of shaft.

The above equipment has been repossessed and never used. It is offered at bargain price. Can be inspected at our yard.

W. B. THOMPSON COMPANY
Iron Mountain, Michigan
Phone 2121

COLORS *For Cement and Concrete*

COLOR YOUR CONCRETE WITH LANSCO CEMENT COLORS, available in 40 ATTRACTIVE shades. Suitable for all types of concrete products. Write for our new color card, copy of "Suggestions For Using Cement Colors", and for free samples and price list.

Manufactured by:

Landers-Segal Color Co.
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CONCRETE BRICK COLORS
CEMENT COLORS
MORTAR COLORS

made by
BLUE RIDGE TALC CO., INC.
Henry, Virginia

UNBREAKABLE
PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

COLOR YOUR CONCRETE!
SMITHKO

LIMEPROOF CONCENTRATED DRY COLORS
Write for samples and brochure, "Getting Results With Color in Concrete and Cement Products"
SMITH CHEMICAL & COLOR CO.
53 JOHN ST. BROOKLYN-3, N. Y.

FOR SALE

Kent Super Blockmaker. Semi-automatic, one block, vibrating machine with 4" and 8" molds. Ideal for small and medium size plants. Two years old and in wonderful operating condition. See it in operation at our plant. We are going into a two-block machine and will sell our present machine very reasonable.

ACME BLOCK & SUPPLY CO.
1506 Mackinaw St., Saginaw, Michigan
Phone 34418

FOR SALE
STONE SPLITTER
(USED)

Will split blocks up to 8" high and 28" in length. Priced reasonable.

BOX M-84, ROCK PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

LOWER COST
PACKER-HEAD WINGS
Proved to last as long or longer — yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS

FOR SALE

Fork and platform power lift trucks, used and guaranteed factory rebuilts.

ERICKSON POWER LIFT TRUCKS, INC.
Saint Anthony Blvd. & University Ave. N.E.
MINNEAPOLIS 18, MINNESOTA
Phone—Sterling 1-9508

BUILD GOOD WILL

Advertising necessities for the block industry. Line Pins, Twigs, Corner Blocks, Calculators. Complete catalog on request.

GERSON CO. 82 Doering Rd.
MATTAPAN 26, MASS.

FOR SALE

No. 7 Jolterete with 4", 8", 10" and 12" attachments, racks and pallets. Priced for quick sale. Good condition.

Fergus Concrete Products Co.
Box 271, Fergus Falls, Minn.

STOP that WATER

With FORMULA NO. 640

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

PLAIN STEEL PALLETS

Furnished from prime domestic open hearth mild steel plate.

Guaranteed Quality
Flat • Square • Accurate
any size or thickness

GARY STEEL SUPPLY COMPANY
2300 S. Springfield Avenue Chicago 23, Ill.
CRawford 7-2525

WANTED

GOOD USED SMITH 2 C. Y. TILTING CONCRETE MIXER

PRICE BROTHERS COMPANY
1932 E. Monument Avenue, Dayton, Ohio
Telephone Hemlock 7861
Purchasing Department

ALSO SEE WHERE TO BUY ADVERTISING ON OTHER EQUIPMENT IN ROCK PRODUCTS' GENERAL SECTION

For Sale - Can You Use?

2—three yard truck mixers mounted on tandem trucks, daily operation, one unit recently overhauled, one overhauled last few months.

If you can use some three yard units these are real buys, having to purchase larger units.

See Mr. Moxie

L. S. RANHORNE INC., Owners
STAUNTON, VIRGINIA

MAKE OFFER FOR

2 Block Lith-I-Bar Machine with attachments for 12, 8, 6, 4, and 2 types of Chimney Block. Numerous spare parts. 2400—18x18x5/16 Steel Pallets.

In good condition.

IDAHO MASONRY PRODUCTS
1390 Highland Avenue
Twin Falls, Idaho Phone 3060

Small Block Plant Owner

I have quite a supply of used machines that are replaced by larger plants who need larger production. Some of these setups are in very good condition. As they are a surplus to me, I will sell on any reasonable terms with payments as low as $50.00 a month.

Mid-Western Concrete Equipment Co.
Box 646 Mukwonago, Wis.

this sword challenges CANCER

Under the sign of the cancer sword the American Cancer Society seeks to save lives by spreading vital facts to you, your neighbors, and your physicians . . . by supporting research . . . by providing improved services for cancer patients.

Only under the sign of this sword is there a three-fold, national attack on cancer. Cancer Strikes One in Five. Your Dollars Will Strike Back.

Mail Your Gift to "Cancer" Care of Your Local Postoffice

AMERICAN CANCER SOCIETY

6-HI PRESSURE AUTOCLAVES

IMMEDIATE DELIVERY WITH QUICK ACTING DOORS. EACH KILN IS CAPABLE OF CURING 4000 8" EQUIVALENTS. PRICED FOR QUICK SALE. IF YOU ARE INTERESTED IN HIGH PRESSURE CURING, IT WILL PAY YOU TO INVESTIGATE AT ONCE.

DINABURG BLOCK CO.
Binghamton, N. Y.

MOLDS with "BUILT-IN" BRAINS & ACCURACY

"ONE-PIECE" Metal Molds for:

SPLASH BLOCKS	VIBRATING TABLES
STEPPING STONES	CHIMNEY CAPS
SILLS & COPING	SEPTIC TANKS

FOR MORE DETAILS WRITE TO: R. L. SPILLMAN CO. 1583 S. High St. Columbus, Ohio

GARBAGE BOX MOLDS

Concrete Garbage Box manufacturer has several surplus molds. Reasonable price. Many communities are ripe for volume business on this item.

BOX M-96, CONCRETE PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE

100—Telescopic Steel Centers, 10' to 16' in A-1 condition, $45.00 each, F.O.B. El Paso.

THE ATLAS BUILDING PRODUCTS CO.
P. O. Box 601, El Paso, Texas

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

SUPERINTENDENT OF MANUFACTURE FOR CONCRETE PIPE PLANT

Large well-established middle-western company needs man with minimum of five years experience who carried full responsibility for the manufacture of concrete pipe, block, or allied field to take charge of all activities in plant having 50-man work force. Qualifications include ability to direct and get along with men, production know-how, cost consciousness, technical competence to rebuild present plant, and ideas for future expansion program. Age 35 to 45. Good salary and outstanding profit sharing plan. Please reply, giving personal, educational and work history, including present or last salary.

Box M-99, Concrete Products
309 W. Jackson Blvd., Chicago 6

FOR SALE

1953 L-3 Lith-I-Block 2 block machine complete with 4", 8" and 12" attachments and pallet return. 47-60-block racks, 1400 18 x 18 x 5/16 plain pallets. Stearns 28 ft. mixer and skip hoist. Now in operation and priced to sell.

MILLER BLOCK CO.
1714 W. Franklin St., Evansville 12, Ind.
Phone 2-2554

MANAGER WANTED

Gulf Coast concrete block manufacturer desires manager who is capable of producing sales as well as blocks for plant in this fast growing area. All replies confidential.

BOX N-1, CONCRETE PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

Universal semi-automatic tamper — Model E-8 8 bar tamper with 1,000 7⅝x15⅝ pressed steel pallets.
Relineable Mold Box 7⅝x15⅝.
Block Machine—used only two seasons and in good condition. $1,000 or best offer.

GREEN CONCRETE PRODUCTS CO.
1660 Dearborn Avenue, Aurora, Ill.

FOR SALE

1400 PLAIN STEEL PALLETS
¼x16½x18 . . . . . @ 70c each
66 STEEL WELDED RACKS (for above pallets) holds 72—8" blocks. . . @ $35 each

FRIENDSHIP BLOCK & BRICK CO.
11800 Pleasant St., Detroit 17, Mich.
Phone VI. 2-0200

BLOCK MACHINE FOR SALE

Universal Automatic Block Machine, complete with 1250 modular aluminum pallets and mold box, $595.00.

Fleming Manufacturing Co.
Cuba, Missouri

FOR SALE

One Stearns Model A Clipper block machine, about 1300—8" steel pallets, 500—12" cast iron pallets, racks and rail system, and one pallet oiler.

Winger Concrete Products
Hazelhurst, Wis.

ENGINEER wishes management position with small Concrete Products producer or material yard. 5 years experience in construction field, with strong background in general business procedures. Age 30, married, Chicago area preferred. References. BOX M-98, CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Ill.

INDEX TO ADVERTISERS IN THE CONCRETE PRODUCTS SECTION OF ROCK PRODUCTS

SEE INDEX OF ROCK PRODUCTS SECTION ADVERTISERS ON PAGES 217, 218

THE NEW LITH-I-BLOCK

THE MACHINE THAT'S GOT EVERYBODY TALKING!

OVERWHELMING ACCEPTANCE AT THE CLEVELAND EXPOSITION MAKES LITH-I-BLOCK THE LEADER FOR **HIGH-QUALITY, LOW-COST, VOLUME PRODUCTION**

EQUALLY ADAPTABLE TO THE NEEDS OF LARGE OR SMALL PRODUCER

All sensitive electric and pneumatic controls inside a single, fully-enclosed heated cabinet.

Only a machine offering the flexibility and compactness of this new Lith-I-Block with its proven record for consistent production of highest quality block could meet with such instant approval. Now, better than ever, the new Lith-I-Block brings you these advanced features.

New dual-eccentric, egitator drive outside of feed drawer eliminates need for internal shaker rods.

CENTRALIZED CONTROL CABINET — removes all major valves and switches from dirt and vibration.

FULLY AUTOMATIC — one man operation with Automatic Front Pallet Return. Easily added to any Lith-I-Block Machine.

POSITIVE 4-POINT HEIGHT CONTROL — insures absolute dimensional stability and uniform output

QUICK-CHANGE MOLD BOX — complete change over in less than twenty minutes

5 STANDARD MODELS — a size to meet the requirements of every block producer

WRITE TODAY FOR COMPLETE DETAILS ON THE NEW LITH-I-BLOCK MACHINE

ONE PIECE OF EQUIPMENT OR A COMPLETE PLANT LAYOUT

LITH-I-BAR CO.

HOLLAND, MICHIGAN

SALES AND SERVICE THE WORLD OVER

LITH-I-BAR CO. HOLLAND, MICH.

Please send full information on LITH-I-BLOCK MACHINE

Firm Name_____

Individual_____ Position_____

Address_____ Phone_____

City & State_____

ON THE JOB!

THE NEW TRAVEL BATCHER

The TRAVEL BATCHER can travel behind a truck with complete safety without Hi-way violation. On arriving at a destination, average set-up time is ten minutes.

Batch mixture is maintained uniformly with accurate scales mounted on the machine. The capacity of the TRAVEL BATCHER is 60 yards an hour delivered into mixer trucks.

By bringing the batch plant closer to the job, it reduces the number of truck mixers needed by as much as 83%.

Maintenance bills, long a headache of every ready-mix concrete operator, are reduced to a minimum.

The TRAVEL BATCHER offers the performance of a stationary batch plant, plus the convenience of mobility.

NORTH . . . EAST SOUTH . . . WEST

Satisfied customers everywhere make similar statements

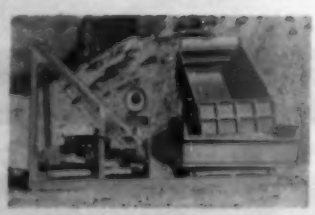
JOHN L. SAVAGE

Carson City, Nevada, says:

"I have used several types of batchers . . . I've even made my own . . . but my new 'On the Job TRAVEL BATCHER' can accurately outproduce any other portable batch plant . . . because of its mobility I am getting jobs that I had to give up before . . . I plan on getting another TRAVEL BATCHER in the spring . . ."

JOHN L. SAVAGE

The hopper, with a capacity of 8 yards can be recharged with either a dump truck or a front-end loader.



TRAVEL BATCHER

For additional information write, wire or phone:

SOUTHEAST READY-MIX - 6430 HOLLADAY BOULEVARD - SALT LAKE CITY, UTAH

WHERE TO BUY

A 60 Year Old Company requires a

PLANT SUPERINTENDENT *for* LIGHTWEIGHT AGGREGATE *and* CONCRETE BLOCK PLANTS

Must have had successful experience operating an aggregate plant. Ceramic background advantageous, but not essential.

Should have ability for plant layout and material handling. Experience in manufacturing quality block is essential.

Company is a leader in the industry, located in medium size city adjacent to large metropolitan area. Man selected will have supervision of well seasoned organization and must have ability to handle all phases of production including labor relations.

Our staff knows of this advertisement.

Salary open. Write in complete confidence.

BOX M-97, ROCK PRODUCTS
309 W. Jackson Blvd.
Chicago 6, Illinois

IMMEDIATE SHIPMENT

BOILERS
6—804 HP Kewanee Firebox Boilers, Model 800, 125 PSI, soot blowers, ASME.
4—150 HP HRT Boilers, 150 PSI, gas fired, ASME.

BUCKET ELEVATORS
19' to 70' ce., 6"x4" to 15"x12" buckets.

COMPRESSORS
12"x7½"x12" I. R. Imperial, 327 CFM, 60 HP Slipring motor, 4'x7' receiver.
1800 CFM, I. R. PRE-2, 100 PSI, 300 HP.

CONVEYORS
36" x 54' Apron.
42" x 50' Troughing.
18" x 65' Troughing.

CRUSHERS
18"x36" Jaw, Traylor, Bulldog.
14"x16", Bartlett & Snow, 2 roll.
48" Symons, vert. disc.
42"x14" Traylor, 2 roll.
26"x24" Williams Impact Crusher.
15"x18" Jeffrey, single roll.
60" Raymond, 5 roll, high side.
Raymond No. 1, double whizzer complete.
Gates #5, Style K, Gyr. 36" opening.

KILNS—COOLERS—DRYERS
10'6" x 112' x ⅝" Traylor.
10' x 50' x ½" Louisville.
9' x 80' x ⅝" Allis Chalmers.
8' x 125' x ½".
6' x 67' x 5/16".
6' x 50' x ⅜" Ruggles-Coles.
4'6" x 50' x ¼" with lifters.
604-24 Roto-Louvre.
810-16 Roto-Louvre.

SCREENS
4' x 7' Tyler-Hummer, single deck.
5' x 8' Link-Belt, double deck.

HEAT & POWER CO., INC.
70 PINE ST., NEW YORK 5
Hanover 2-4090
Machinery & Equipment Merchants

Type 151-M Marion Electric Shovel, 7½ yd. dipper, excellent condition.
2—111-M Marion Diesel Shovels.
3—54B Bucyrus Erie Diesel Shovels, 2½ yd. & draglines.
2—605 Koehring shovel-draglines.
25 ton Plymouth Gas. Locomotive, 56½" ga.
16 Ton Vulcan Gas Loco; 36" ga.
107 H.P. Self Contained Steam Boiler, Nat'l Bd. 100#, used a few months.
40 ton Ohio 8 wheel stm loco. crane, 50' boom; Outriggers, air brakes, generator for magnet.
2—Link Belt Motorized Speed Reducers, output speed 24.7 RPM. 15 H.P. slip ring 440 v. motors with brakes, A1 cond; $600.00 ea.
Lot parts for D-8 Cat Tractor, rails, grousers, rollers, LeT Push Dozer Arm.
500' used 54" conv. belt, 13/16" thick, 1 roll.
D-13000 Caterpillar diesel engine, 7264 hrs. Just reconditioned. $1500.00.
100 HP Allis Chalm. Slip Ring Motor, 490 RPM. 2300 v. ball brg; C-H drum controller, resistance, switches. $800.00.

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SURPLUS EQUIPMENT

Available throughout the U.S. — Items you need may be available near you. Your inquiries would be appreciated.

Buildings	Derricks	Loaders	Pavers
Bins	Draglines	Locomotives	Rollers
Barges	Ditchers	Mixers	Rail
Buckets	Dredges	Motors	Scales
Belting	Drills	Mills	Screens
Cableways	Engines	Machine-tools	Stacklines
Cars	Excavators	Pulverizers	Shovels
Compressors	Feeders	Pipe	Tanks
Conveyors	Graders	Pumps	Tractors
Crushers	Generators		Trailers
Dryers	Hoists		Etc., Etc.
	Kilns		

(I can sell your surplus equipment)

ALEX T. McLEOD
MARIETTA, KANSAS

FOR SALE OR TRADE

BUDA 150 DIESEL MOTOR and Drives with No. 4 UNIVERSAL CRUSHER with $800.00 new parts for ROLL OR CONE CRUSHER.

Also want 1¼ yard DRAGLINE BUCKET.

JERSEY QUARRY CO., Fieldon, Ill.

CARLYLE

INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

IMMEDIATE DELIVERY OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — FIRE, WATER, SUCTION, AIR, STEAM AND WELD HOSE

AIR HOSE
WATER HOSE
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LOW PRICES!

Immediate Deliveries

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6" x 3" to 60" x 48"

Before buying or selling any FARREL-BACON JAW CRUSHERS it will pay you to consult

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RIDGEWOOD, NEW JERSEY
Engineers and Manufacturers
Machine Shop Facilities
FEEDERS, Conveyors, Screens, etc.
Send for Catalogue

ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT WHERE TO BUY ADVERTISING IN CONCRETE PRODUCTS SECTION

ATTENTION

GRAVEL AND STONE PRODUCERS

Gravel plant, 125-ton per hour capacity consisting of six wood bins, one 46"x26'6" triple jacket revolving screen, two vibrating screens, two sand separators, one 4' Symons Cone crusher, one roll crusher, one 8" centrifugal pump, 16" to 30" material conveyors. All plant equipment individually motor driven. Plant located adjacent to railroad on twelve acre tract, 2250' of loading tracks.

Gravel deposit depleted, available stone deposit within economical operating belt conveyor distance. Shipments may be made on two major rail lines without switch charge. Good setup for experienced stone operator. Prefer to dispose of plant as a unit but will consider selling piecemeal.

Also one, 1-yard P & H crane suitable for material yard, one 1-yard Monighan dragline, all in operating condition, miscellaneous buildings, small tools, spare parts and supplies.

RAY & SON, INC.

LOUISIANA, MO.

FOR SALE

One complete Sauerman Scraper 5 cu. yd. capacity includes double drum winch, 250 h.p. G. E. motor, with controls, 5 yd. Crescent bucket, main mast and guys. Two tail masts, with bridle and shifting motor. Used 6 mos. Contact

IDEAL CRUSHED STONE INC.

P. O. Box 338 Hialeah, Fla.

or call Miami, Fla. 64-4503

EQUIPT. IN N. Y. — CALIF. — ILL. — TEX.

8 MODERN LOCOMOTIVES

1—44 Ton & 5—125 Ton G.E. Diesel Elec.
1—65 Ton Whitcomb Diesel Electric
1—8 Ton Brookville Diesel

4 LOCOMOTIVE CRANES

30 Ton Ohio Diesel—30 Ton Ohio Steam
2—25 Ton American Diesels

ALLIS CHALMERS CRUSHING ROLLS

54 x 24, 42 x 16, 36 x 16, 36 x 14 and 30 x 16

HEAVY DUTY APRON FEEDER

REX 54" x 10'3" Slat Type, Very Good

STEEL STIFF LEG DERRICK

25 Ton Dobbie with 104 Ft. or 60 Ft. Boom

18 ELECTRIC AIR COMPRESSORS

Inger. Rand & Chgo. Pneu., 198', 676', 1302', 1576', 2200', 3076', 3726' and 5000'.

DARIEN, 60 E. 42nd St., New York 17, N. Y.

FOR SALE OR RENT

25 ton Orton Diesel Locomotive Crane.
65 ton Porter Diesel-Elec. Locomotives.
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130 HP Amer. 2D Diesel Hoist & Swinger.
4 yd. P&H Elec. #1400 Quarry Shovel.
2 yd. Bucyrus Erie 51-B Diesel Shovel.
1¼ yd. Manitowoc 2000B Diesel Crane.
1200 CFM Ing. Rand XRE, 200 HP Compr.
50 Steel Dump Cars 36" Ga., 12 ton.

Mississippi Valley Equipment Co.

513 Locust St. St. Louis 1, Mo.

FOR VALUES — BUY BRILL

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2—9'x80' Allis-Chalmers, ⅝" shell.
1—8'x125' Vulcan ⅝" shell.
1—8'x70' Allis-Chalmers ⅝" shell.
1—7'x120' Vulcan ½" shell.
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1—5'x67' Reeves 5/16" shell.
1—5'x40' Cummer ⅝" shell.
2—5'x30' Cummer 7/16" shell.
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2—3'10"x16' Link Belt Roto-Louvre.

PULVERIZERS-MILLS

2—Raymond High Side Mills 8 and 5 roll.
2—Pennsylvania Model SXR-100, 100 Tons per hour.
2—Raymond #1 Pulverisers with 6' whizzers.
5—Hardinge 4½'x16", 5'x22", 6'x22", 6'x 48", 10'x48".
8—Patterson 6'x8' Ball Mills.

CRUSHERS

2—Allis Chalmers 10" Superior McCully Crushers, V-belt drive.
1—Allis Chalmers K-9 Gates Gyratory Crusher.
10—Jaw Crushers 5"x6" to 42"x48".

SCREEN SEPARATORS

6—Tyler Hummer Screens 5'x5', 4'x5', 4'x7', 4'x10', 5'x10', 4'x15'.
1—Link Belt 5'x8' double deck Screen.
5—Rotex 40"x84", 40"x120".
4—Air Separators 6', 8', 10', 14'.

OTHER ITEMS

2—Chicago 14"x7" Air Compressors, 484 cfm.
2—Oliver Rotary Dewaterers 8'x4'.
12—Bucket Elevators 20' to 75' centers.

COMPLETE LIME HYDRATING PLANT

consisting of two #3 Clyde Hydrators, two #1 Raymond Mills, Elevators, Conveyors, etc. Send for Details.

PARTIAL LIST

Send Us Your Inquiries

BRILL EQUIPMENT COMPANY

2401-3 Third Ave., New York 51, N. Y.
4101 San Jacinto St., Houston 4, Texas

Tel: Cypress 2-5703

CONVEYORS

BELT or DRAG

ANY WIDTH or LENGTH

What Do You Need?

LIBFOSTER co.

INDUSTRIAL EQUIPMENT DIVISION

P. O. Box 1647 PITTSBURGH 30, PA.

Giant Bradley Mill & 300 HP motor.
Nos. 12, 10, 9, 8, 7½ and 6 Allis-Chalmers gyratory crushers.
222 & 322 Allis-C. Allis-C.—R & 20" & 36" Traylor TY Crushers.
8'x48", 6'x22", 5'x22" Hardinge mills.
1—42"x16", 36"x16", and 24"x14" crushing rolls.
2—New 6½'x150' Kilns.
1—Complete lime hydrating plant.
1—40"x48", 36"x48", 30"x42", 24"x36", 18"x36", 15"x30", 12"x24" jaw crushers.
6x12 & 8x10 Rod mills.
14", 10", 8", 6" McCully Superior Crushers.
5½'x22 and 6'x22 tube mills.
5'x50'x1¼" dryer. 4½x40, 7x120, 8x125 Kilns.
New and Rebuilt Dryers—Kilns and Coolers

W. P. HEINEKEN, INC.

90 Broad St., N.Y. Tel. Wh. 4-4226

Quarry Equipment

Cedarapids 4040 double impeller complete with V-belt drives, two 100 HP motors, starters, etc. Reconditioned.
Cedarapids Rock-It plant w/2225 jaw, 3033 hammermill.
Telsmith 13B gyratory 13" primary or secondary.
Cedarapids CCC 4024 roll crusher unit.
936 Telsmith Wheeling jaw.
10 x 7 Allis-Chalmers Blake type jaw crusher. Rebuilt.
#1 Cedarapids Kubit impact breaker. New condition.
Symons 3'x12' double deck screen.
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Special bins to your specifications.
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Seven Duplicate Machines

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1—Elevator, Stephens Adamson, Buckets 24" x 36", steel chain, 125' centers with drive, 200 T.P.H.
1—Screen 5' x 9' single deck, Tyler Niagara, Type 500.
2—Screens 4' x 6' single deck Allis Chalmers, Utah Type.
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6—Pumps, Wilfley, Slurry, Sizes 2", 3" and 6" Mdls. "C" and "K".
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2—Hydroseparators 60" x 45" Wemco.
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For further information contact J. H. Clements in care of BASIC REFRACTORIES, INC.
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Cedarapids Model AA2226; also 16x16 Pitmaster, Lippman 3456 & 1634, Cedarapids 3640 "Motor" 16, 1634 Super-Tandem, Pioneer 4-deck 9x24, 6x12 Marcy Rod Mill like new. Also 42x60 Allis-Chalmers Jaw Crusher, Screens, Cablewar, Conveyors, Compressors, Draglines, Shovels.

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One complete Sauerman 1 yd. heavy duty slackline excavator. Complete with cables, 2 drum elec. hoist, etc. Like new condition — Timken Bearing Carriage for Bucket. Priced to sell.
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wanted by multiplant Cement Company in the East for supervisory duties, research and development. Applicant must have degree in chemistry and 5 years plant laboratory or cement research experience. Some travel necessary. Good future. Give full details of education, background and experience. Replies will be kept confidential.

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1—Ball Mill, Allis Chalmers 8'8'22 two stage complete.

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Needed for single-plant cement company located in Northeastern U. S. Prefer applicants under 40 years of age. Qualifications should be sufficient to assume position of Chief Chemist within a reasonable time. Replies, which will be kept confidential, should include details on experience, training, age and other pertinent data. Our employees know of this advertisement.

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Major heavy machinery manufacturer, located Midwest, has excellent opportunities for mechanical design engineers experienced in research and development and in new product design of machinery used in mining, crushing, cement and basic processing industries. Also sales engineers who have experience in this industry or in sales of heavy machinery. Exceptionally fine working conditions and opportunity for future. Write, stating education, experience, present employment, personal data and salary expected. Replies confidential.

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UNIVERSAL 203Q Port. Crushing Plant, w/10x24 r.b. Jaw Crusher, 30x18 rolls, apron feeder, vibr. screen, diesel power, mounted tandem rubber. Very Good. $18,000.

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CEDAR RAPIDS "Morcok" 2-Unit Portable crushing plant. Primary portable w/2540 r.b. Jaw, feeder, conveyor, on tandem rubber. Secondary portable w/10x36 Jaw, 40x22 rolls, vibr. screen on tandem rubber. Bins, conveyors, motors for full electric or diesel operation. New 1947, used 2 yrs. Al. $32,500 West Coast.

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COMPRESSORS: 2—Ingersoll Rand PRE-5, 14x11x16, 244 H.P., 225 RPM, 2300 volt, synchronous motors. Chicago Pneumatic OCB, 1944 CFM, 300 H.P., 440 volt, 3 phase, 60 cycle.

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OVERHEAD ELECTRIC CRANES: Whiting 8 ton, 54' span, 4 motor, clam shell bucket operating, 440 volt, 3 phase, 60 cycle. Several other cranes both AC and DC, various spans, 5 tons to 55 tons, 2 and 4 motor.

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BOX M-83, ROCK PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

CRUSHERS: 1024 & 1526 CR, 1218 Acme, 1836 Eagle, 2036 Pioneer, 2436 Lippmann, 2450 Champion, 2540 CR, 4836 Diamond, 4240 & 8466 Allis C JAW, 10, 14 & 16" McCully, 322R Allis, 12K Gates, 16B Telsmith, 4' T9 Telsmith GYR. 2, 3 & 4' Symons CONE.

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MILLS: Williams Comet 4 roll, Marcy 6 x 12, Hardinge 6 x 3 & 8 x 4' Ball, 3033, 4033, 5040 Dixie, 3024 Jeffrey, Williams 3'4 & 5' Hammer.

DRYERS: 4x24, 5x40, 6x50, 6x80, 7x120 & 8x125', 25 Ton American Model 925 CD Diesel LOCO. CRANE.

45 Ton Plymouth Diesel LOCOMOTIVE.

Eagle 36" x 25' rgl. screw CLASSIFIER.

CHAIN ELEVATORS: 29', 48', 60' & 122' centers.

SHOVELS & DRAG: Koehring 304, Buckeye 70, Lorain 75B, Link Belt K370, Lima 604, 802, 1201, NWS, 75 & 85, P&H 805, 1055, Bucyrus 38B, 51H, 120B, 170B, 175B, Lorain 520, Marion 40A, 92, 92M & 300, Monighan TW.

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- ___Air Separators
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- ___Bags*
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- ___Batchers
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- ___Dryers
- ___Dump Bodies*
- ___Dust Collecting Equipment & Supplies
- ___Electric Motors
- ___Engineering Service, Consulting and Designing
- ___Explosives & Dynamite
- ___Fans and Blowers
- ___Feeders*
- ___Fifth Wheel, Heavy Duty Special
- ___Flotation Equipment
- ___Front End Loaders*
- ___Gasoline Engines
- ___Gear Reducers
- ___Generator Sets
- ___Grinding Media*
- ___Gypsum Plant Machinery
- ___Hard Surfacing Materials
- ___Hoists
- ___Hoppers
- ___Kilns: Rotary, Shaft, Vertical
- ___Locomotives*
- ___Lubricants*
- ___Magnetic Separators
- ___Masonry Saws
- ___Mills*
- ___Pipe*
- ___Pumps*
- ___Scales*
- ___Screen Cloth*
- ___Screens*
- ___Scrubbers: Crushed Stone, Gravel
- ___Shovels, Power*
- ___Speed Reducers
- ___Tanks, Storage
- ___Tires and Tubes
- ___Torque Converters
- ___Tractor Shovels*
- ___Tractors*
- ___Trailer Dump Bodies
- ___Trucks, Bulk Cement
- ___Trucks, Industrial
- ___Trucks, Mixer Body
- ___Trucks, Motor
- ___Valves
- ___Vibrators
- ___Welding and Cutting Equipment
- ___Winches
- ___Wire Rope

If equipment you are in market for is not listed above, write it in the space below.

_____

_____

_____

Your Name_____ Title_____

Firm Name_____

Street_____

City_____ State_____

RP-2

ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT WHERE TO BUY ADVERTISING IN CONCRETE PRODUCTS SECTION

BONDED EQUIPMENT BARGAINS

WRITE, WIRE OR PHONE — IMMEDIATE SHIPMENT FROM STOCK

BONDED HEAVY DUTY VIBRATING SCREENS

"For continuous, economical screening of high tonnages"

For all minerals, chemicals and industrial products. To size, grade, clean and separate solids from liquids. Heavy duty models are 4-bearing, positive throw eccentric shaft type, 5' x 8' to 5' x 14', 1 to 5 decks. Other models have eccentric weight mechanism, spring mounted; 1 to 3 decks; from 2' x 4' to 3' x 8'. All models low priced, with minimum maintenance and power consumption.

Heavy Duty prices from .....$1095.00 General Purpose prices from $395.00

NEW TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2⅞" diam. shaft. Belt is new 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
16"	20'	$ 991	$ 548
16"	45'	1785	937
18"	25'	1229	684
18"	45'	1839	1005
18"	85'	3209	1665
18"	100'	3704	1912
24"	25'	1322	773
24"	45'	2062	1145
24"	100'	4097	2166
24"	130'	5207	2773
30"	25'	1421	847
30"	65'	3101	1718
20"	30' (5-Ply	1453	864
20"	50' Belt)	2189	1301

Other lengths and belt widths at bargain prices.

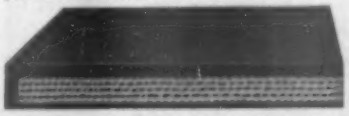
NEW MOTOR TRUCK SCALES

For stationary and portable applications. Scales have steel lever system complete with structural steel weighbridge. Capacities to 50 tons. Recording beams available.

20 Ton Truck Scales (Pit Type) .....$ 782.00
20 Ton Truck Scales (Portable) 1336.00

NEW CONVEYOR BELTING SAVE 28%

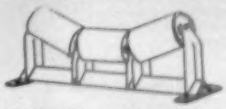
Heavy duty 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	List Price	Sale Price
16"	$3.64 foot	$2.62 foot
18"	4.03 foot	2.90 foot
24"	5.23 foot	3.76 foot
30"	6.39 foot	4.60 foot

Additional widths and plies available at low prices. Write for free sample.

NEW IDLERS & RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" dia. Troughing Idlers for

16" belt..	$17.25	30" belt..	$19.50
18" belt..	18.00	36" belt..	20.25
24" belt..	18.75	48" belt..	21.75

1-roll, 5" dia. Return Idlers for

16" belt..	$ 6.75	30" belt..	$ 8.25
18" belt..	7.13	36" belt..	8.75
24" belt..	7.50	48" belt..	10.25

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Rust proof ball races. Maintenance is negligible.

CONVEYOR PARTS TO BUILD YOUR OWN CONVEYOR

Write for Literature and Prices

More than 4000 mines and quarries have modernized with Bonded equipment

Write for Catalog and Prices

BONDED SCALE AND MACHINE COMPANY

Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders

128 BELLVIEW, COLUMBUS 7, OHIO PHONES: Hickory 4-2186; FRanklin 6-8898, Evenings

P & H SHOVEL

Model 1005, 2½ cu. yd. capacity, powered by Caterpillar D-384 supercharged engine. Completely overhauled. Available for immediate delivery. Real bargain.

Sierra Machinery Co., Inc.
307 Morrill Avenue, Reno, Nevada
Phone 3-1301

Sand Drag—Lippman 5' x 30'—60 Ton per hr.—$700.

M. G. SNYDER & SONS, INC.
2013 S. Dixie Ave., Dayton, Ohio

INDEX TO WHERE TO BUY

GRADUATE MINING ENGINEER desires employment change. 5 years supervisory and management experience, open pit and underground operations. Location foreign or domestic. 32, married. Capable of taking complete charge operations. BOX M-95, ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Ill.

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How to move

14-TON

limestone blocks

Handling big quarry blocks from pit to loading tackle is one of the toughest 'dozing jobs that can be given a machine. Here at Walker Cut Stone Co., Junction City, Kansas, a veteran CAT* Diesel D8 Tractor with No. 8S Bulldozer moves 20 to 30 of these huge blocks every day. Their average weight is 10 tons and they frequently run as high as 14 tons.

The D8 has done this kind of work steadily since 1948. In addition, it is used for stripping, cleaning the quarry floor, terracing, pond work and timber clearing. Fred A. Dietrich, maintenance superintendent, says: "The built-in ruggedness of the No. 8S 'Dozer will stand up longer under this rough treatment than anything else we know."

Take a close look at a Caterpillar-built Bulldozer and you'll see why. It's engineered to match the power and traction of the big yellow crawler tractor. Welded box-section side arms give it strength and rigidity. Heavy reinforcing ribs back up the blade. And the reinforced lower edge and tough, reversible cutting edge of high carbon steel add to its long life.

Your Caterpillar Dealer stands ready to demonstrate Caterpillar machines on your job. And he backs their profitable work life with top quality service and genuine parts. Call him today.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Le Roi *TRACTAIR* with Mobildrill!

TALK about flexibility — you really get it from Le Roi Tractair with Mobildrill.

Mobildrill is a lightweight CLEVELAND wagon-drill attachment mounted on Tractair, a combination 35-hp tractor and 105-cfm compressor. With it, you enjoy unusual mobility. One man can drill holes at any angle and any elevation up to 12 feet. Swinging boom permits drilling 4-6 holes of a pattern from one spot.

Tractair is really a handy man around a quarry. Its mobility makes it ideal for secondary drilling and drilling toe, as well as for production drilling. You can use it to run hand-held drills and plug drills. And you can use it to run an air-operated sump pump for de-watering.

Have your Le Roi distributor show you Tractair at work, so you can get a first-hand picture of its money-saving versatility. See him soon. Write for job-data sheets and Le Roi Tractair bulletins.

LE ROI *Division of Westinghouse Air Brake Co.*

Milwaukee 14, Wisconsin

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